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Dental Digest

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The Elongated STYLOID PROCESS

WATT W. EAGLE, M.D., Durham, N.C.

DIGEST

Although the styloid process of normal length rarely causes symptoms and many elongated processes cause none, either may become symptomatic. The symptoms usually become evident after tonsillectomy. The elongated process which lies close to the mandible offers the greatest problem to the dentist as it is possible that the process may be fractured during routine dental procedure. The only satisfactory treatment of the symptomatic elongated styloid process is surgery. An analysis of methods of diagnosis and the proper surgical procedure to follow is described in this article.

The Styloid Process of Normal Length

The usual length of the styloid process is 1 inch (2.5 centimeters.) The styloid process of normal length rarely causes symptoms.

Location

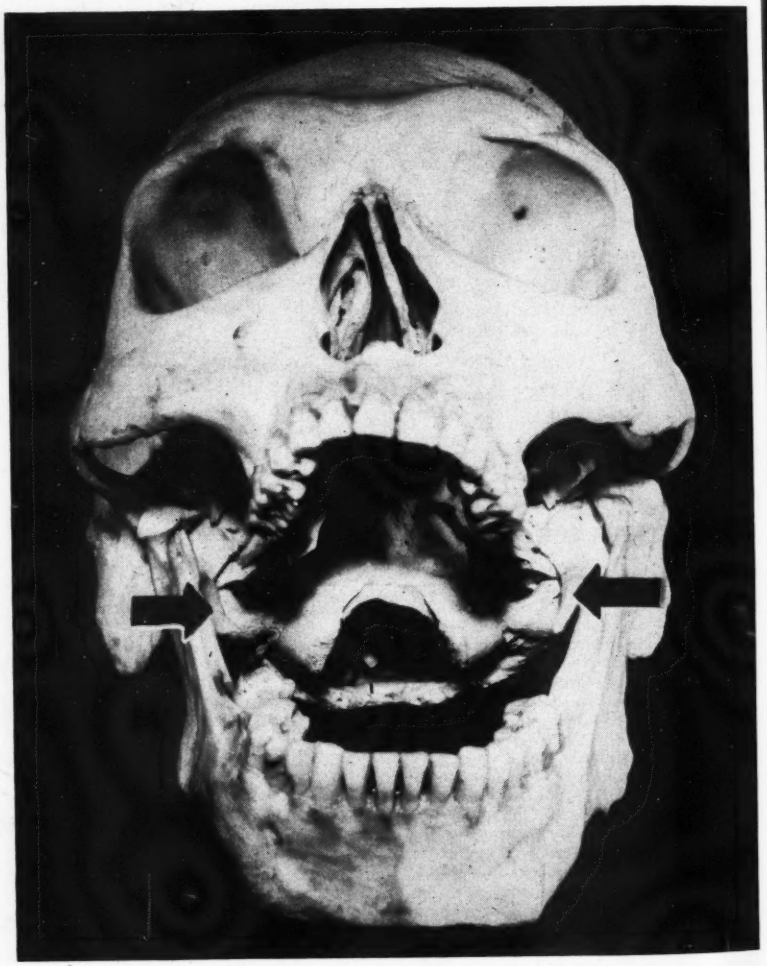
The styloid process usually points anteriorly and medially from its base which is located medial to the mastoid process and just posterior to the stylomastoid foramen through which the facial nerve makes its exit from the skull.

The Elongated Process

Most processes have a straight shaft but some become shaped like a ram's horn. The process sometimes becomes 3 inches (7.5 centimeters) in length. Many elongated processes cause no symptoms whatever and are merely found on routine examinations although either type of elongated process may become symtomatic with symptoms in one of two syndromes.

First Syndrome

In the most commonly encountered syndrome the symptoms usually begin immediately following a tonsil-



1. ***Demonstrating bilateral elongation of the styloid process. The processes do not appear noticeably elongated because they are pointing anteriorly. There is no proximity to the mandible on the right.***

lectomy. The process itself may have prevented or impaired the total removal of the tonsil by surgeons who prefer to use snares and similar instruments instead of applying the free dissection method. Under these circumstances it is possible for the instrument to catch on the tip of an elongated process.

Symptoms—1. An abnormal amount of bleeding may occur because of incomplete removal of the tonsil.

2. The postoperative period will be unusually painful. The elongated process itself is responsible for most of the pain following tonsillectomy which continues for a long time, or until the elongated process is shortened.

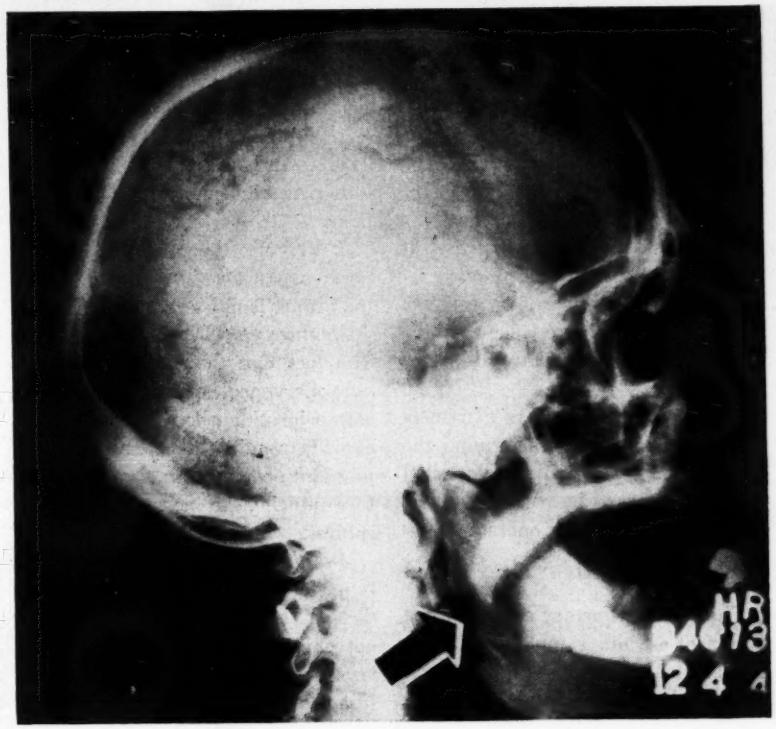
3. Even in clean dissection operations the elongated process may become quite symptomatic.

4. The patient will complain of a soreness in the throat, present to some extent all the time, accentuated during the act of swallowing.

5. There may be a pain referred to the ear on the affected side during swallowing.

6. The swallowing act may be impaired; a sensation of a foreign body in the throat is frequently present.

Syndrome Exhibited to Dentists—The syndrome described is often visible to dentists, especially when the patient's mouth is held wide open. Occasionally, the mucosa of the tonsillar fossa can be seen gliding over the tip of the elongated styloid process. The pain in this syndrome is due to scarring which impinges on some of the nerve endings of the fifth, seventh, ninth, and tenth cranial nerves.



2. ***Lateral roentgenogram demonstrating an extremely elongated styloid process on the right side.***

Second Syndrome

Involvement of Carotid Artery—Since the tip of the process normally lies between the external and internal carotid arteries and any hook or deviation of the tip of the process may cause symptoms, it is conceivable that a normal length process may impinge on a carotid artery.

Symptoms—1. When the deviation of the process occurs (1) in the shaft or (2) at the tip of the process the process may impinge on either the external or the internal carotid artery. When this does occur there will be pain distributed in the pattern of the involved carotid artery and the patient will probably complain of headaches as well as pain.

2. If the external carotid artery is involved there will be symptoms throughout the facial distribution of that artery.

3. Should the internal carotid artery be involved, there will be pain in the ophthalmic region and top of the head on that side, invading the area of distribution of the internal carotid artery.

4. The caliber of the vessel may be impaired with diminished blood flow. Tinnitus may be very annoying to the patient.

Origin of the Pain—(1) The pain is due to the stimulation of the sympathetic nerve fibers which are abundant in the walls of the carotid arteries in the carotid plexus and (2) in the syndrome the tonsils may have been removed but not necessarily so.

Diagnosis

1. When the history is suggestive of an elongated styloid process, the diagnosis is easily accomplished by palpation in the tonsillar fossa.

2. A styloid process of normal length cannot be palpated; if there is firm resistence in the tonsillar fossa no other situation is possible but the presence of an elongated styloid process.

3. In those cases where carotid artery symptoms are suspected, an elongated process may sometimes be palpated through a tonsil.

4. Occasionally the process lies extremely close to the mandible; this is the type of process that is most difficult to shorten surgically. It is also the type that may give the most trouble to the dentist. There have been reports of fracture of the process during routine dental procedures.

Symptomatic Pain on Palpation—In the carotid artery syndrome the artery may be extremely painful on

palpation externally in the cervical region. This is because during the palpation the artery is probably compressed against the styloid process.

Value of Roentgenograms—1. Roentgenograms are helpful in confirming a diagnosis but are used mainly to determine (1) the length of the process and (2) the status of the shaft (whether it is straight or hooked.)

2. The posterior-anterior roentgenogram is of much more value than the lateral views in the carotid artery syndrome.

3. The lateral views are extremely important as aids to determine the length of the segment of the elongated process that is to be resected during the surgical shortening operation.

Surgery

The only satisfactory method in the treatment of the symptomatic elongated styloid process is surgical shortening of the elongated styloid process.

Procedure—The surgical shortening is accomplished by carrying out the following four steps successively:

1. Divide the muscles of the pharynx beneath the tonsillar fossa.

2. Expose the styloid process.

3. Denude the process of its three muscular attachments and two ligaments.

4. Fracture the process at a point previously determined for removal of the proper length segment.

Measure to Prevent Infection—The fact that the wound enters the parapharyngeal space, a serious anatomic location where infection is concerned, requires that sulfanilamide powders be placed in the wound before suturing the incision with catgut sutures.

Anesthesia—The entire operation is performed under light ether anesthesia. The Crowe-Davis mouth gag not only provides exposure but conveys the ether anesthesia to a point just above the glottis.

Recovery—After surgical shortening of the elongated styloid process there is much less sore throat postoperatively than there is following tonsillectomy because the incision is closed. Convalescence is rapid and hospitalization is usually three or four days.

Conclusion

1. Patients undergoing surgery for a symptomatic elongated styloid process are relieved of their symptoms immediately postoperatively.

2. There is no observed defect in swallowing or speech following the operation, indicating that the three muscles and two ligaments attached to the process probably have little important function.

3. The operation for shortening the symptomatic styloid process has been found to provide highly satisfactory results.

Duke Hospital, Duke University Medical School.

Dentistry and the Cerebral Palsied Child

SYLVIA ZAPPLER, M.D., D.D.S.

Cerebral palsy (known by the laity as spastic paralysis) is a group of pathologic states where muscular control is impaired or lost.

Classification of Types

In order of frequency the five main types of cerebral palsy are:

1. Spasticity, which accounts for 50 per cent of all the cases.

2. Athetosis, in which constant involuntary movements occur, accounting for 35 per cent of cases.

3. Ataxia where there is inability to retain balance and hold posture.

4. Tremor.

5. Rigidity.

A Dental Problem

The damage to the brain cannot be repaired but the patient can be helped to overcome some of his disabilities by various therapeutic methods. The dental problem may be considered under two headings, namely; (1) dental diseases and deformities and (2) dental treatment.

Dental Diseases and Deformities

1. Caries. The lack of motor control in these handicapped children makes it difficult for them to maintain adequate oral hygiene. It is also difficult for the dentist to carry out the necessary dental treatment. A considerable amount of caries is frequently found in these children.

2. Inflammation and hypertrophy of the gingivae. These conditions may be ascribed to (1) neglect of oral hygiene, (2) to the incapability of proper chewing, and (3) to nutritional deficiencies.

3. Extreme grinding of the teeth by involuntary movements mostly seen in cases of tension athetoids.

4. Deformities of the dental arches and malocclusion because of abnormal musculature.

Dental Treatment

Dental care is influenced by the following factors:

1. The patient's ability to perform the motor tasks necessary in a program of dental care, for example: (1) opening the mouth, (2) controlling the tongue, (3) chewing food, (4) brushing the teeth.

2. The patient's mental potentiality and his willingness to perform what is necessary to the best of his ability and his cooperation in the dental chair.

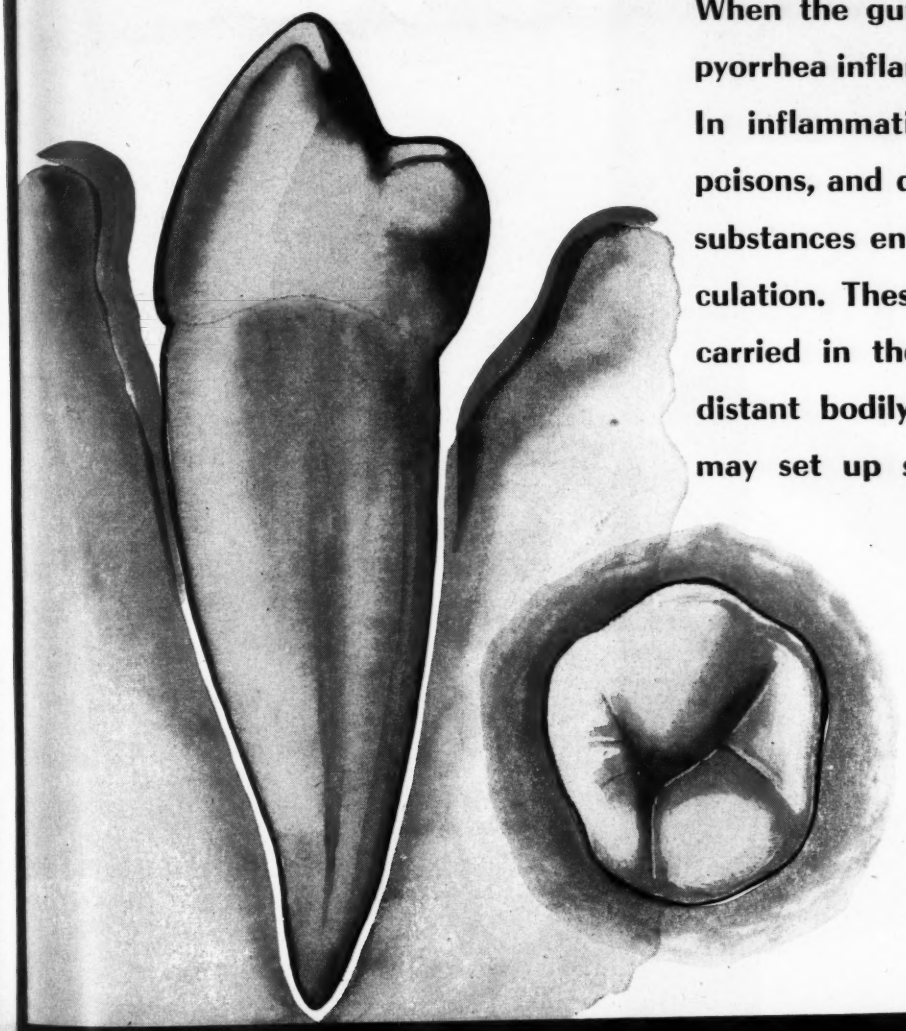
3. The skill and understanding of the dental personnel administering and guiding the care. Dental treatment in some cases is possible only in a reclining position and sometimes only under prolonged general anesthesia.

4. Adequate dental facilities for the treatment of these patients.

(Few hospitals or dental colleges are treating cerebral palsy patients in their dental clinics. Institutions which provide medical and educational service for the cerebral palsied are not equipped with dental facilities. In the private dental office treatment

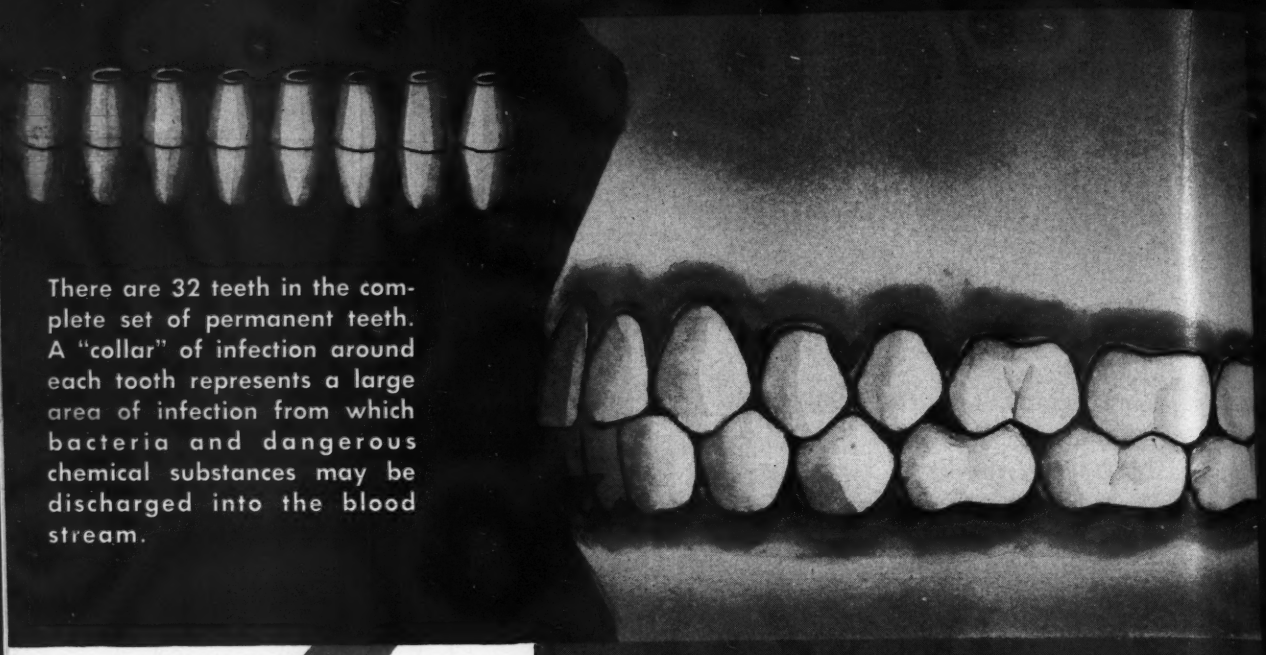
(*Continued on page* 428)

the DANGERS from PYORRHEA AND POSSIBLE COMPLICATIONS

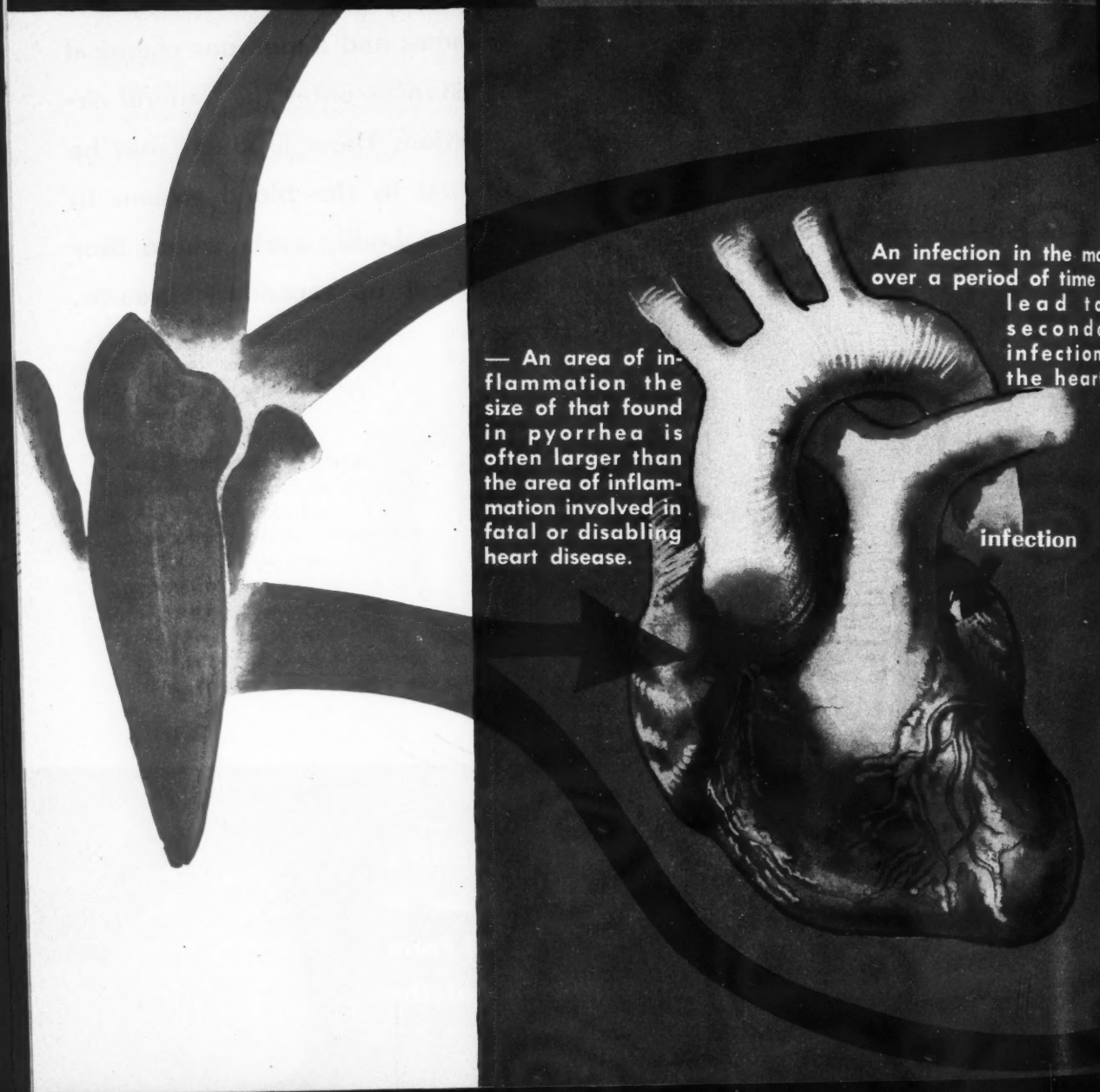


When the gums are involved in pyorrhea inflammation is present. In inflammation bacteria, their poisons, and dangerous chemical substances enter the general circulation. These products may be carried in the blood stream to distant bodily parts where they may set up secondary diseases.

An area of pyorrheal inflammation around a tooth is like a collar of infection. This "collar" is connected with the blood circulation and from it infection may spread to other organs of the body.



There are 32 teeth in the complete set of permanent teeth. A "collar" of infection around each tooth represents a large area of infection from which bacteria and dangerous chemical substances may be discharged into the blood stream.



— An area of inflammation the size of that found in pyorrhea is often larger than the area of inflammation involved in fatal or disabling heart disease.

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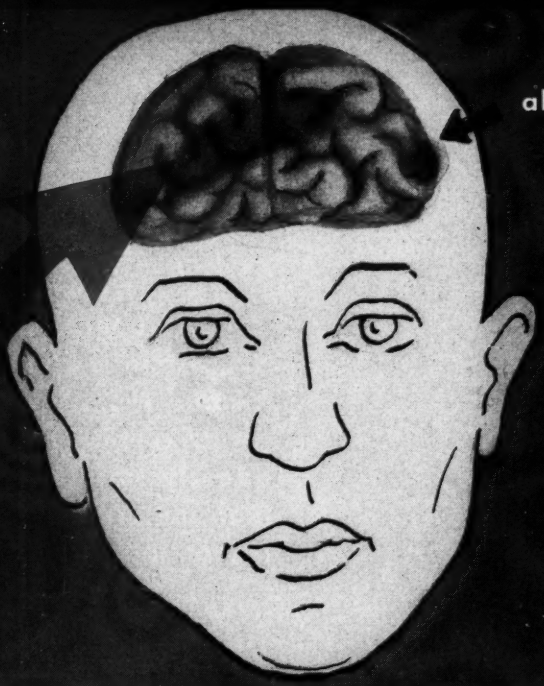

An abscess of the brain often may be a smaller area than the zone of infection about the teeth in pyorrhea. Another secondary infection from infected teeth may develop in the brain.

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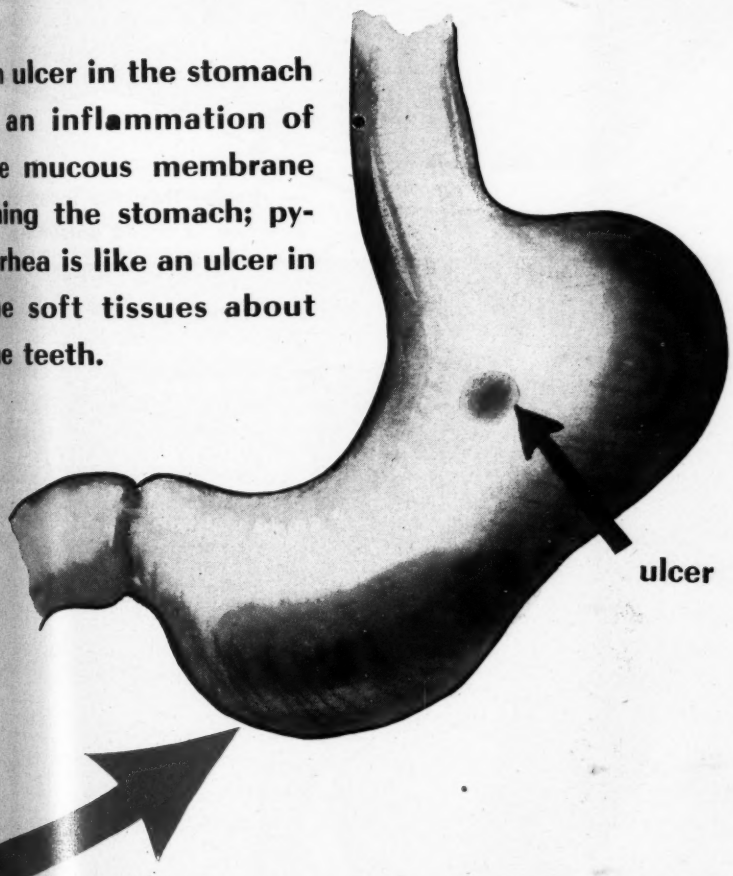

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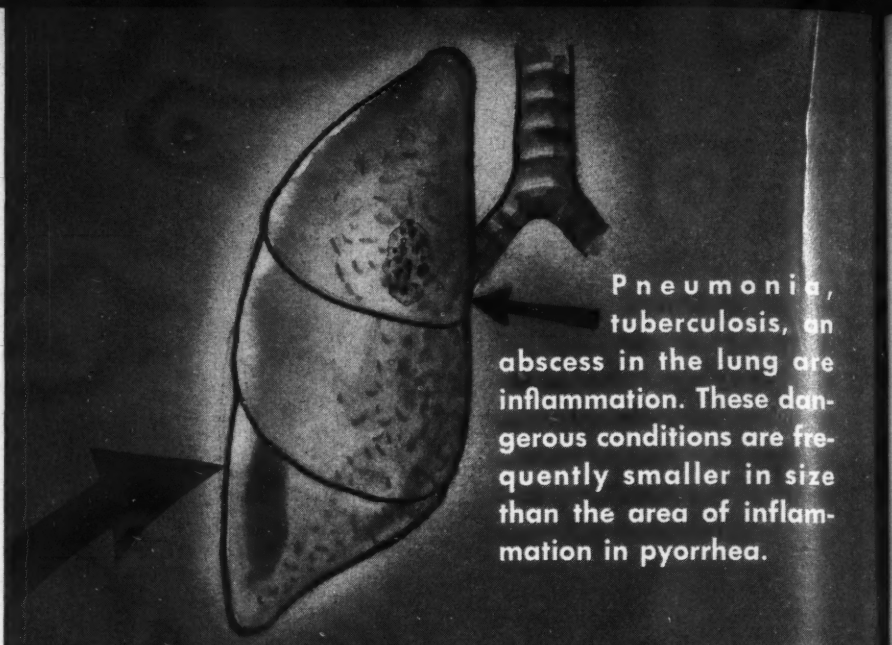
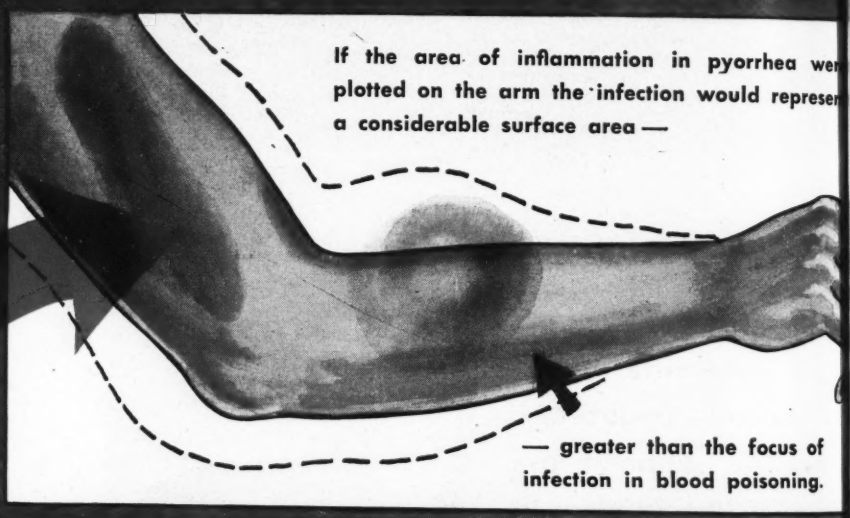
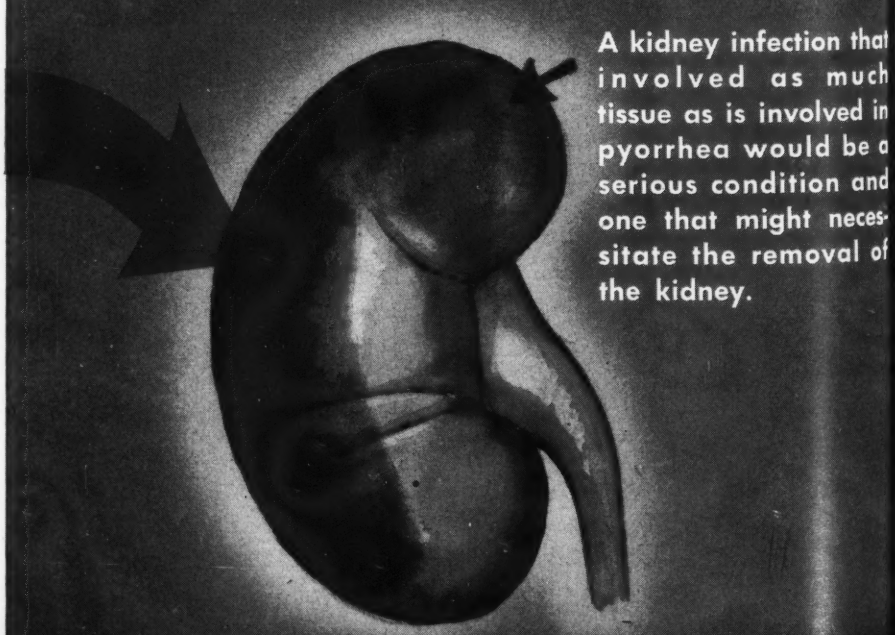


Pneumonia, tuberculosis, an abscess in the lung are inflammation. These dangerous conditions are frequently smaller in size than the area of inflammation in pyorrhea.



If the area of inflammation in pyorrhea were plotted on the arm the infection would represent a considerable surface area —

— greater than the focus of infection in blood poisoning.



A kidney infection that involved as much tissue as is involved in pyorrhea would be a serious condition and one that might necessitate the removal of the kidney.

Special Note: PLEASE TEAR THIS WHITE AREA OFF CHART

WELDING

for the General Practitioner

JACK PERLOW, D.D.S., Brooklyn

DIGEST

Although spot welding has been used mainly in orthodontics, the author of this article considers it a valuable adjunct to general dentistry. Various ways in which spot welding can be used in the dental office and step-by-step directions for the procedures required are given.

The Principle of Spot Welding

When two pieces of chrome steel are spot welded the electric resistance of the current is so great that it causes a fusing of the metals to each other.

Salient Features—A spot welder that is designed for dental use has several salient features:

1. Variable heat control which can be set according to the amount of current required. This is determined by the thickness of the metals to be welded. In dental practice low settings usually suffice.
2. An operating switch which sets off the current and should be taped as quickly and gently as possible. Many light welds are preferable to one or two heavy welds.
3. Pressure under which the electrodes are adjusted at all times. The two electrodes are set in their holders until they meet evenly. The upper is then pushed down on the lower about ⅛ of an inch and locked in position.
4. Electrodes which are made of copper with ends of variable size. Fine pointed electrodes are preferable. The diameter of the electrode affects the quality of the weld.

Four Variables—Spot welding depends on four variables: (1) Current, (2) exposure, (3) pressure, and (4) the diameter of the electrodes.

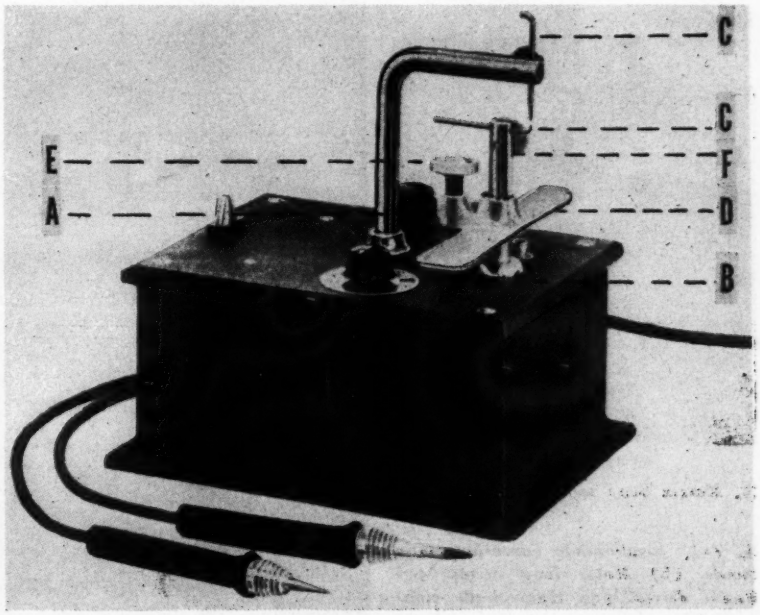
These variables must be paired one against the other to weld chrome steel satisfactorily. Welding technique is readily learned from experience.

Applications of Spot Welding to Dental Practice

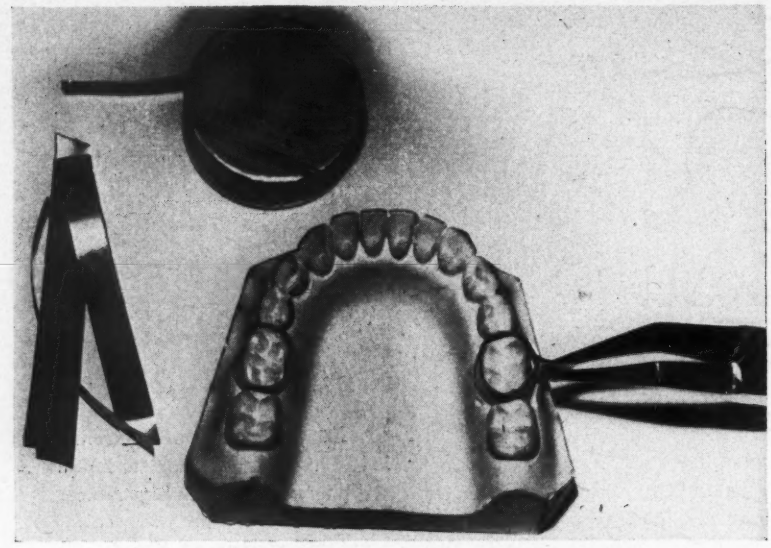
1. Matrix bands.
2. Bands.
3. Space maintainers.
4. Splints and inclined planes.

Matrix Bands

Stainless steel matrix is readily obtained in .002-inch or .003-inch thickness. Matrix bands are used for (1) amalgam, (2) silicate, (3) direct



1. ***Welding machine for dental use. (a) Operating switch. (b) Current control 1-5. (c) Electrodes. (d) Platform to release pressure. (e) Nut to adjust pressure. (f) Nut to hold electrode.***

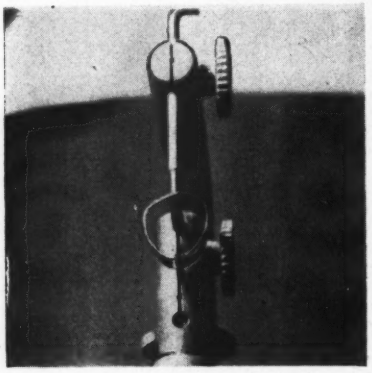


2. ***Matrix bands. Shows strips of hard stainless steel, .002 by .250-inch, and steel matrix roll. After pinching the band with fingers, the band is pinched and a crease is made with band-forming pliers.***

plastic restorations, and (4) direct inlay patterns.

Method of Use—1. A strip about 2 inches long is wrapped around a tooth. The thinness will permit it to pass all contact points.

2. A pinch is made with thumb and forefinger.



3. ***Matrix band welded.***

4. ***(a) Ready-made anterior loop bands. (b) Molar loop bands. (c) Bands driver. (d) Home-made right angled instrument to stretch loop band and to adapt the edges of the band to the tooth. (e) Howe's pliers. (f) Curved shears.***

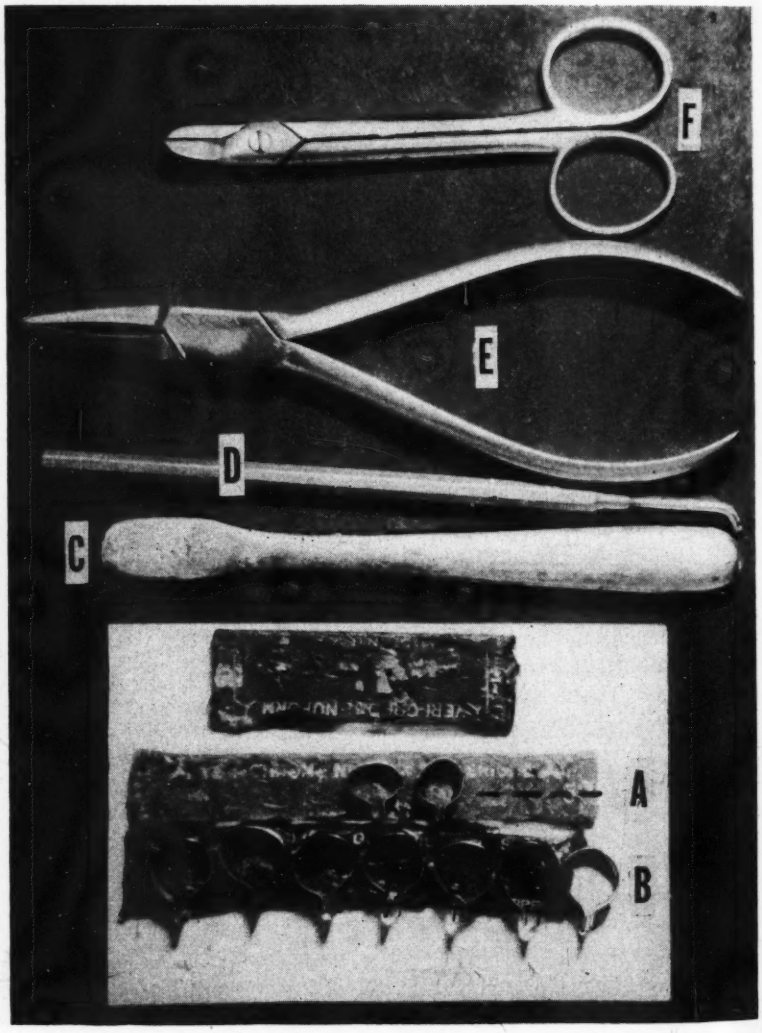
3. One or two welds are made at the point of pinch. Excess is cut off and the band is replaced.

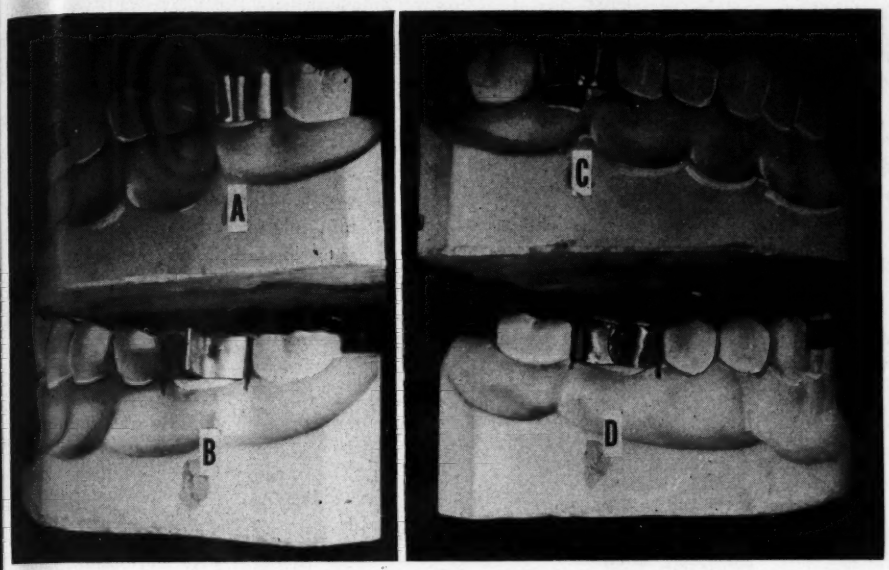
4. With Howe's pliers (band forming pliers) the welded part is pinched and worked up and down until a well-defined crease is formed.

5. Several welds are then made as close to the crease as possible.

6. The excess is cut off, leaving a 1/8-inch lap. This lap is bent over and welded down to prevent cutting cheeks or lips (Figs. 2 and 3).

Variety of Uses—These bands have wide utility including the following uses: 1. They eliminate cumbersome matrix holders. 2. Third molar compound cavities are filled as easily as any others. 3. Two or more teeth can be restored at the same time.





5. ***Steps in molar band construction. (a) Molar loop band in position. (b) Pinch made. (c) Inner piece welded. (d) Polished and finished.***

Bands as Restorations

Molar band material, chrome steel (18-8), extremely soft and highly polished, .002-inch wide and .006-inch thick is used. Bands are used to restore the mesiodistal diameter of deciduous molars and cuspids.

Procedure—1. Cut strips 1½ to 1¾ inch.

2. The ends are lapped for 1/16 of an inch and welded.

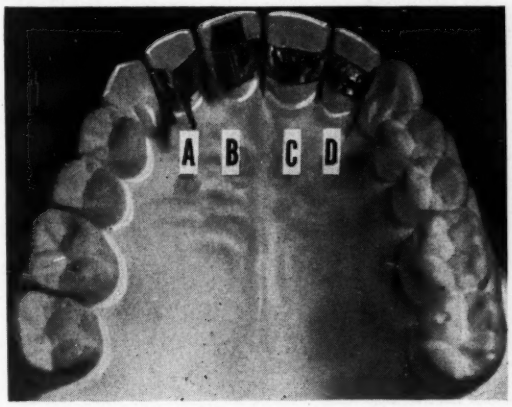
3. Loops are bent out with fine round nosed pliers. These loop bands are used for making direct molar bands on permanent molars, for space maintainers ,and for deciduous molars as restorations (Fig. 4).

4. A molar loop band is placed over the tooth. Separation is seldom necessary as soft chrome steel easily passes most contact points. The loop is placed near the mesiobuccal cusp.

5. The band on the lingual is pressed with the thumb. Then, using thumb and finger grip on the rounded end of a band driver, mold the metal against the lingual surface of the tooth.

6. Keeping the lingual part of the band covered with the thumb of the left hand, insert a right angled amalgam plugger or similar instrument into the loop and pull outward buccally, using the right thumb as support against the buccal surface of the second bicuspid or second molar according to location.

7. The beaks of the band forming pliers pinch the loop at the mesiobuccal angle and are worked up and down until a perfect crease is formed.



6. ***Steps in anterior band construction. (a) A loop band on lingual of tooth and stretched by a suitable instrument. (b) Inner piece of band material welded. In this case it is the same thickness as that used for anterior bands (.003 inch by .150 inch.) (c) Excess is cut off with shears. (d) Finished band, smoothed and polished with a small eyelet welded.***

8. The band is then removed from the mouth and several welds are made as close to the crease as possible.

9. Now place a piece of .004-inch band material inside the band, underneath the welded joint. Several welds are made at opposite sides of the preliminary weld.

10. Excess is cut away from the joint and the inner piece of metal. It is then ground down with a stone and smoothed with a disc.

11. The band is replaced and readapted.

12. Wherever the band stands away make slits with curved crown shears to a depth of 1/3 to ½ the width of the band. These slits are readapted to the tooth and welds are placed on the laps of the slits. Contouring and finishing is done in the usual way (Fig. 5).

Restoring a Deciduous Molar—Where a band is employed in restoring a deciduous molar with proximal caries the following procedure can be carried out: 1. Remove caries with hand instrumentation. 2. Protect the pulp with a thin veneer of cement of zinc oxide and eugenol. 3. Cement the band.

Cuspid Bands — Band material should be .004 by .150 inch. Cuspid bands are made in a manner similar to that described. Loop bands are fabricated and similarly fitted (Fig. 6).

Space Maintainers

The important feature in space maintainers is the construction of one or two molar bands. A number of standard designs for space maintainers are shown in McBride's and Hodgeboom's textbooks on pedodontics (Fig. 7).

Splints and Inclined Planes

Teeth undergoing periodontal treatment frequently require splinting. Different methods of splinting are resorted to, such as ligating with steel ligature or grassline. Banding is superior to these methods. A method of splinting by means of continuous banding is presented. When completed the splint can be cemented and left for the necessary period of treatment.

Procedure—1. Metal strips are inserted between the teeth where splinting is indicated.

2. A plaster impression is taken in a bridge tray. The metal strips remain in the impression which is poured in low fusing metal.

3. In the construction of a splint for three or four teeth band metal .003 inch by .150 inch is used. A length of about 2½ inches is pressed against the labial surfaces.

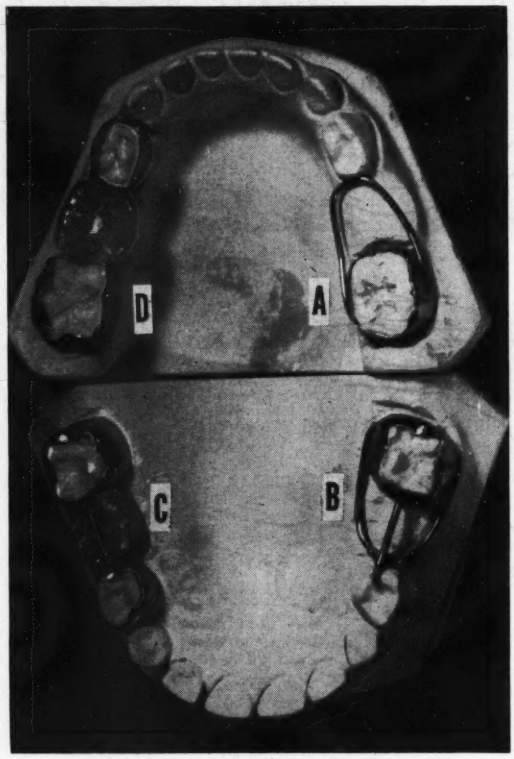
4. At opposite interproximal surfaces, the ends of the band material are pulled through, leaving one end longer than the other (Fig. 8A).

5. The shorter end is held on the lingual. The longer end is worked from the lingual and bent continuously in and out until it meets the shorter end.

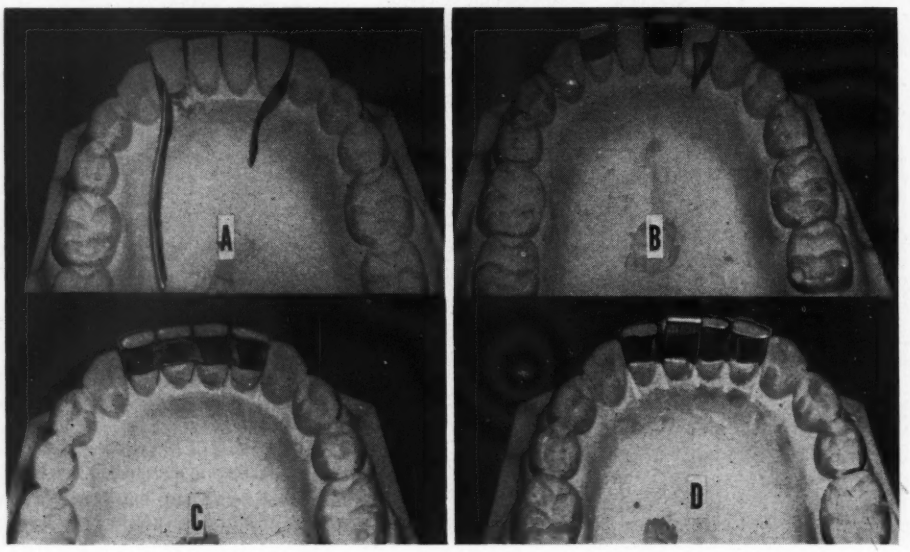
6. The two ends are pinched with pliers and the ends are welded (Fig. 8B).

7. A piece of metal long enough to cover the lingual surfaces of the teeth is welded (Fig. 8C). Another piece of band material can also be welded onto the labial surface for extra strength.

Correcting a Crossbite Relation—The continuous banded appliance with one or two inclined planes attached can be utilized for treating a crossbite relation of one or more upper anterior teeth (Fig. 8D). This is made by welding on a tongue-like projec-



7. *Shows standard types of space maintainers. Four types are shown. (a) A simple maintainer with a loop with loop wire, .003 inch. (b) To this loop wire a retainer is added, a wire across, resting as a lug on the first deciduous molar. (c) An acrylic tooth placed in the space around a swivel joint and a band on the first deciduous molar. The female part is a punched-out buccal tube welded to the proximal surface of the band. The male part is a round wire bent at a right angle, fitting the tube. (d) A three-unit one-piece retainer suitable for some cases.*



8. *Steps in the construction of a splint. (a) Shows a strip of metal about 2½ inches long through interproximal spaces of teeth. (b) Note longer end and short end. The longer end is worked from the lingual and bent continuously in and out. Ends are pinched and welded. (c) A piece of metal long enough to cover the lingual surfaces is welded. This extends from distal to distal of the lower incisors as shown. (d) Inclined plane. This is made by welding on a piece of .010-inch soft metal and welded on to the labial and lingual surfaces of the splint. The four teeth will support the appliance to facilitate the correction of a central in crossbite position.*

tion on the appliance, using .006 or .010-inch metal (Figs. 9 and 10).

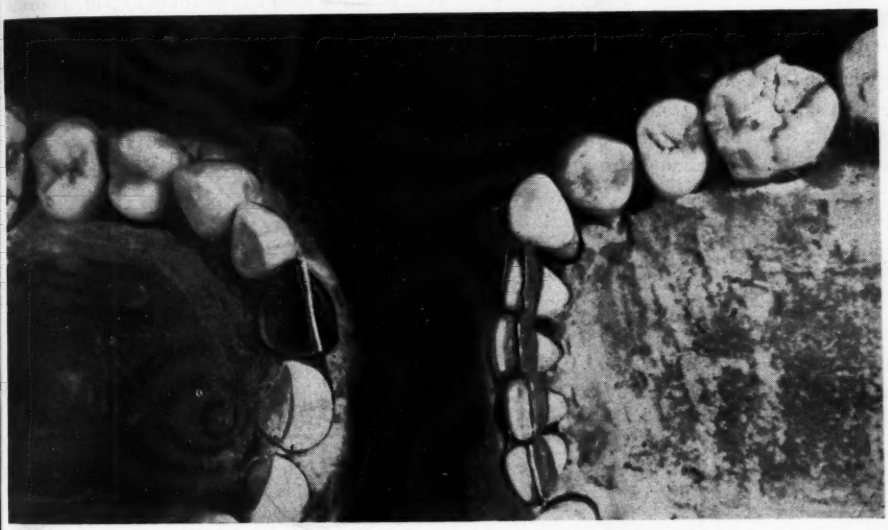
Conclusion

1. Welding has an important function in the dental office and is of value in general dentistry as well as for special uses.

2. The welding machine has been found in many instances to be one of the most useful in the dentist's armamentarium.

1777 *Ocean Parkway.*

9. ***Shows the front view of an inclined plane made on an upper central and a lower splint.***



10. ***Occlusal views of an upper inclined plane and a lower splint.***

Cod Liver Oil in Maxillary Sinusitis

The employment of cod liver oil by Hunermann[1] in maxillary sinusitis ten years ago was followed by results so favorable that since then he has used this method routinely for diagnostic and therapeutic purposes.

Method of Use

Following puncture of the maxillary sinus, without previous irrigation 2 cubic centimeters of cod liver oil are introduced.

Diagnostic Value

Instillation of cod liver oil has a diagnostic value in that it reveals contraction of the lumen and presence and nature of the secretion as follows:

1. If there is no swelling of the mucosa and no secretion in the cavity the cod liver oil remains in the cavity which ordinarily has a capacity of from 3 to 4 cubic centimeters.

2. If there is swelling or secretion the cod liver oil will run out. It will displace any serous or purulent secretion that may be present in the sinus.

3. If only the oil without an admixture of secretion runs out, a polypous proliferation of the mucosal lining exists.

Purpose

1. The purpose of instillation of cod liver oil is therapeutic.

2. It replaces the secretion and exerts a favorable effect on the inflammation.

3. In many instances not only was the suppurating maxillary sinusitis favorably influenced by the cod liver oil, but accompanying bronchitis and otitis media were also cured.

From Current Medical Literature, *Journal of the American Medical Association* **140**:924 (July 9) 1949.

[1]Hunermann, T.: Cod Liver Oil in Treatment of Maxillary Sinusitis. Acta Oto-Laryngologica, Stockholm 36:447 (September-December) 1948.

ACUTE INFECTIONS

Arising from the Teeth

A. WELDON MOULE, F.D.S.R.C.S. (Eng.), B.D.S., Manchester, England

Surgical Anatomy

Deep Fascia—The deep fascia invests and holds the muscles, blood vessels, and viscera in position and is condensed in certain areas to form definite laminae.

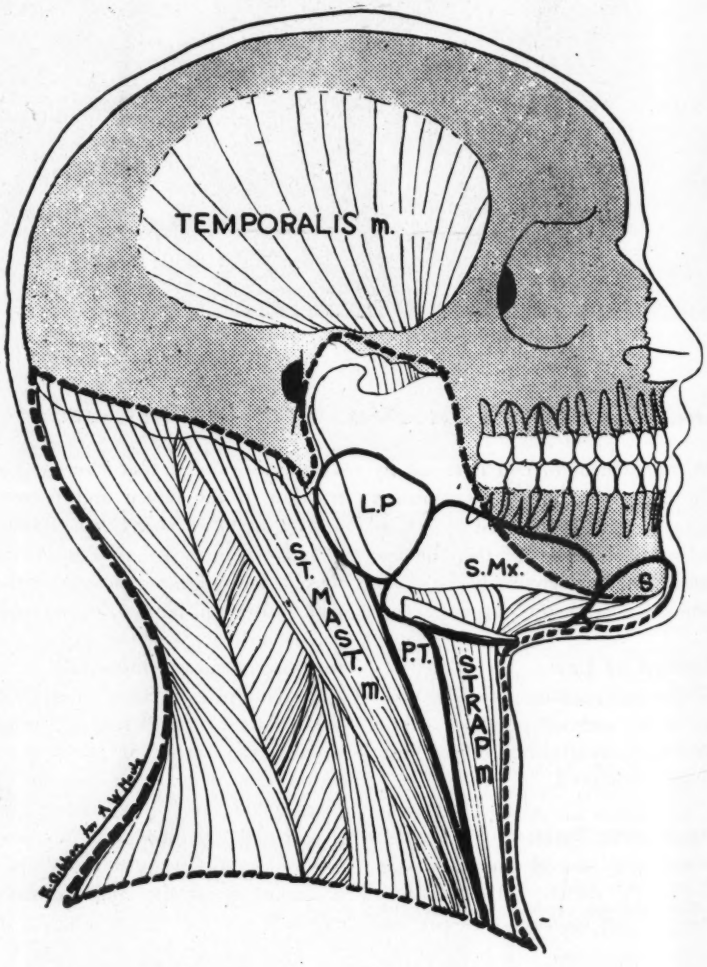
Investing Layer—The outermost laminae provides a strong fascial envelope enclosing the structure of the neck (Figs. 1 and 2). In the interval between the angle of the jaw and the sheath of the sternomastoid muscle fibers are considerably strengthened. This explains why pus accumulating in this area is likely to be directed along the anterior border of the sternomastoid muscle toward the pretracheal space. Pus is more likely to point in the suprasternal triangle than it is to burrow deeply into the pretracheal space proper and possibly down to the mediastinum (Figs. 2 and 4).

Pretracheal Fascia and Pretracheal Space—At the level of the thyroid cartilage there is a condensation of the deep cervical fascia lying in front of the trachea. This is known as the pretracheal fascia and the area between it and the investing fascia is the pretracheal space which is continuous with the mediastinum (Figs. 2 and 4).

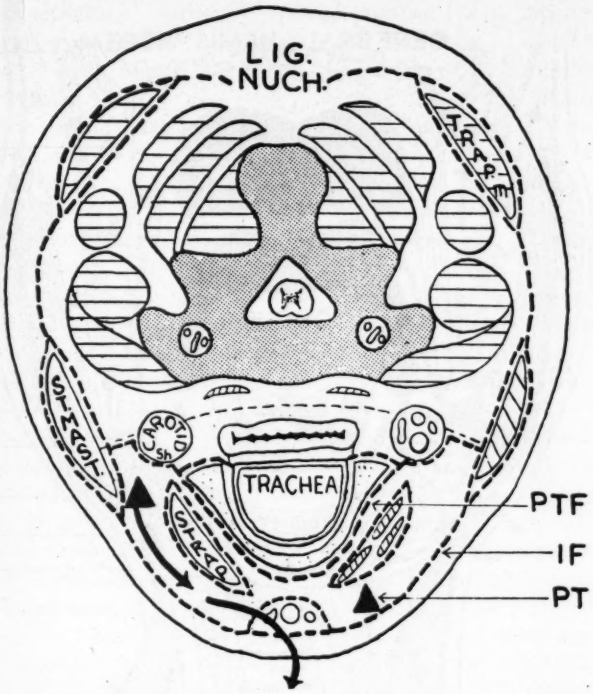
Submaxillary Space—At the level of the hyoid bone the fascia splits to enclose the submaxillary gland, the internal thinner lamina gaining attachment to the lower part of the mylohyoid ridge and the outer layer (investing fascia) to the inferior border of the mandible. The area between these septa is the submaxillary space (Fig. 4).

Muscles—(1) the mylohyoid, (2) the muscles of the tongue, (3) the pharyngeal constrictors, (4) internal pterygoid, and (5) the masseter, are of particular importance to the spread of inflammatory exudate.

These muscles in conjunction with the fascial laminae, form potential compartments. Any of the spaces described are sites where the supporting tissues are weakest. The exudate is therefore able to collect and track with less mechanical resistance than in other areas where the fascial con-



1. ***Schematic side-view to show the attachment of the investing layer of the deep cervical fascia (dotted lines) and the surface markings of the lateral pharyngeal (L.P.), submaxillary (S.M.), submental (S.), and pretracheal spaces (P.T.).***



2. ***Transverse section of the neck indicating the investing fascia (I.F.), the pretracheal fascia (P.T.F.), and the direction taken by infection in the pretracheal space (P.T.).***

densations or muscles act as barriers to the spread.

Musculofascial Spaces—The mylohyoid muscle divides the floor of the mouth in the transverse plane into the sublingual space and the submental and submaxillary spaces.

Mylohyoid Ridge is of Importance—of considerable importance is the relationship of the mylohyoid ridge to the apexes of the mandibular teeth because perforation of the lingual cortex below the ridge is always followed by more serious complications.

Superficial Sublingual Space—Between the mandible and the hyoglossus muscles and above the mylohyoid muscle lies the superficial sublingual space (Figs. 3 and 4).

Deep Sublingual Space—Bounded by the geniohyoid, genioglossus, and hyoglossus muscles, the deep sublingual space (Figs. 3 and 4) extends towards the laryngeal tissues and so may afford an easy channel to the mediastinum.

Submental Space—Below the symphysis of the mandible between the mylohyoid muscles and the investing layer of the deep cervical fascia lies the submental space which is continuous posterolaterally with the submaxillary space (Figs. 1, 3, and 4).

Submaxillary Space—Situated medially to the body of the mandible this space is enclosed by the fascial lamina. The submaxillary space communicates posteriorly with the lateral pharyngeal compartment where the submaxillary gland is in relation to the attachment of the internal pterygoid muscle. Inferolaterally, there is connection with the lateral part of the pretracheal space along the anterior border of the sternomastoid muscle (Figs. 1 and 4).

Lateral Pharyngeal Space—This space (Figs. 1 and 4) is bounded laterally by (1) the parotid gland, (2) the ascending ramus and internal pterygoid muscle, (3) medially, by the superior constrictor, and (4) anteriorly, by the pterygomandibular raphe.

Submasseteric Space—This space (Fig. 4) lies between the ascending ramus and the masseter muscle and continues upwards under the zygoma to the superficial temporal area.

Pterygomandibular Space — Between the medial surface of the ascending ramus and the internal pterygoid muscle (Fig. 4) the pterygomandibular space communicates above with the deep temporal and pterygoid regions. The latter site is in immediate relation to the base of the skull and the many foramina there.

Spread of Infection

1. When the infection has reached the purulent stage the subsequent complications are influenced (a) by the site of the perforation of the cortex, and (b) by the extension of pus into the musculofascial compartments. The infection may be walled off or continue to extend according to (1) the situation, (2) the intensity of the infection, and (3) the resistance of the body tissue.

2. The pus may perforate the cortex directly opposite the focus or it may track along the medullary spaces to some point distant from the source of infection.

3. The exudate may point through the periosteum at the site of the cortical perforation or it may burrow along to point some distance away or enter a musculofascial compartment.

4. The outer plate is most commonly involved. This may be because the lymphatic drainage is mainly in a downward and outward direction.

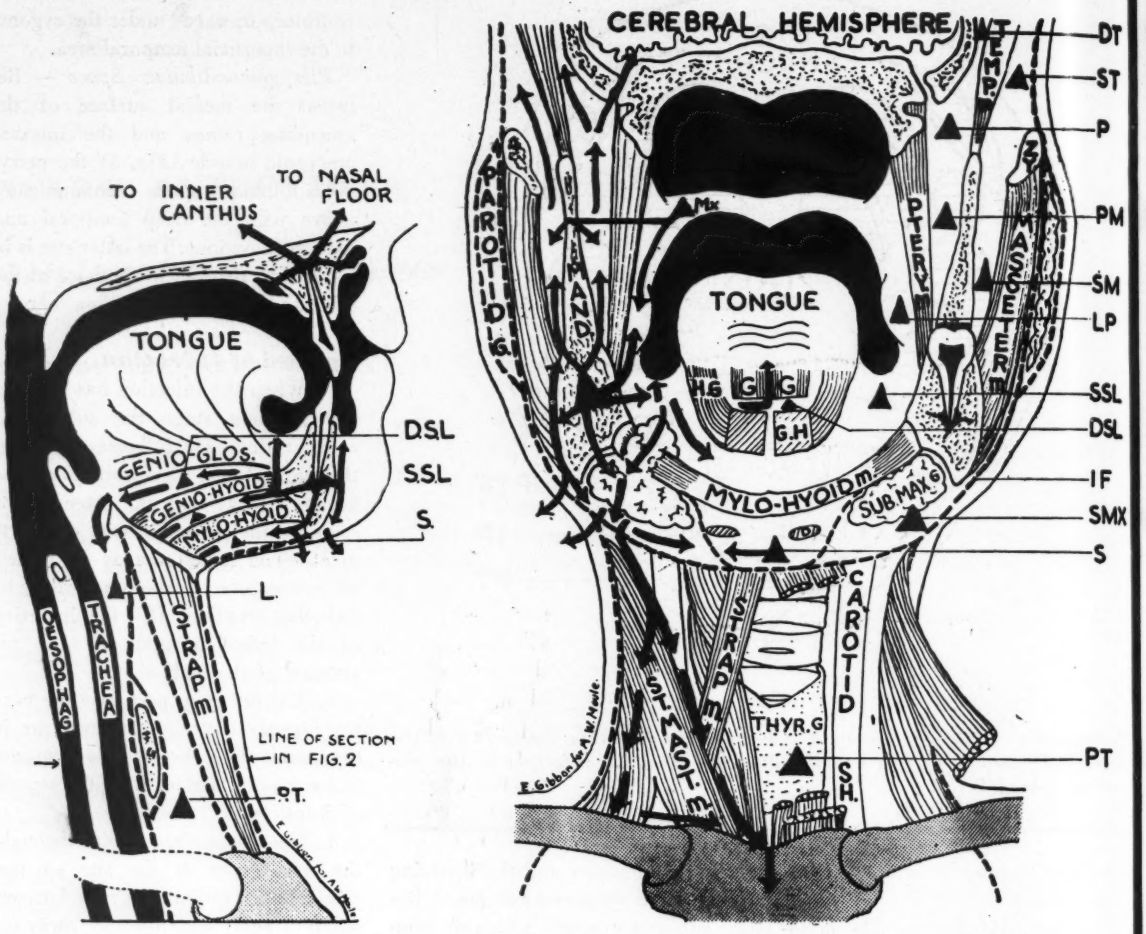
Extension in the Mandible

In the Anterior Part of the Jaw—

1. Perforation of the *outer plate* is followed by the pus either (a) pointing in the sulcus or (b) burrowing under the periosteum to form a superficial abscess at the chin (Fig. 3).

2. Because the apexes of the teeth are above the mylohyoid muscle, perforation of the *lingual plate* leads to the formation of a superficial sublingual abscess. There may be a direct or lymphatic spread through the mylohyoid muscle into the submental space.

3. Should the infection track *downwards* by subperiosteal or direct bone spread, the submental space becomes the site of an abscess which



3. and 4. ***Schematic saggital and coronal sections to indicate the musculo-fascial compartments and the pathways taken by pus in spreading infection. D.S.L., Deep sublingual; D.T., Deep temporal; G.G., Genioglossus muscle; G.H., Geniohyoid muscle; H.G., Hyoglossus muscle; I.F., Investing fascia; L.P., Lateral pharyngeal; L. Laryngeal extension; Mx., Maxillary extension; P., Pterygoid; P.M., Pterygomandibular; P.T., Pretracheal; S., Submental; S.M., Submasseteric; S.Mx., Submaxillary; S.S.L., Superficial sublingual; S.T., Superficial temporal; Zy., Zygoma, Cervical fascia is represented by the dotted line.***

usually points in the submental triangle; but occasionally there is a backward extension to involve the submaxillary space.

4. Infection from the anterior part of the mouth may burrow under the periosteum or along the medulla and the inferior dental canal and enter any of the routes usually associated with posterior teeth.

In the Posterior Part of the Jaw—1. Perforation of the *outer plate* may result (a) in an abscess pointing in the sulcus or through the skin near the inferior border of the mandible, or (b) subperiosteal extension under the insertion of masseter may occur. Pus accumulating in this position strips the periosteum and muscle-fibers from the bone.

2. Pus may then (1) *ascend* into the submasseteric space or (2) descend by subperiosteal extension into the submaxillary compartment.

3. If the pus is not localized there or treatment is delayed, it may burrow under the anterior border of the sternomastoid muscle.

4. When the infection tracks *backwards* from the submaxillary space, the lateral pharyngeal compartment is also involved.

5. Perforation of the *lingual plate* involves both the submaxillary and the lateral pharyngeal spaces by direct continuity.

6. When the pus tracks upwards along the anterior border of the ascending ramus it may enter the pterygomandibular space. An infection in this site is particularly dangerous because extension is possible into the pterygoid area and so to the base of the skull where the numerous foramina provide an easy passage to the dural sinuses. This space may also become infected following an inferior dental injection.

Extension in the Maxilla

1. A direct perforation is common either in the palate or the sulcus.

2. A direct ascending infection may involve either the maxillary sinus or the nasal floor, depending upon the position of the causal tooth.

3. A medullary extension with osteomyelitis may occur in the maxilla but is less frequent than in the lower jaw.

4. An ascending infection along the anterior surface of the maxilla towards the orbit may occur with possible phlebitis of the angular vein.

5. Backward extension may (1) involve the pterygoid region, (2) pass from the posterior buccal sulcus to the anterior border of the ascending ramus, and (3) extend into the pterygomandibular or submasseteric space.

Pathology

The pathology of these acute infections, essentially that of acute inflammation progressing to pus formation and local tissue necrosis, may be considered in the following order:

1. Pericoronal and periapical infection.
2. Extension into the jaw itself.
3. Spread in the soft tissues.

Pericoronitis—In this condition the surrounding tissues are edematous and there may be periodontitis of the involved tooth. Extension of the infection into the musculofascial planes is accompanied by signs and symptoms indicative of the particular space involved.

Periapical Infection—Intense pain occurs while the pulp is dying. Hyperemia is severe with marked leucocytosis and serous exudation. Pain increases in intensity until tension is relieved by the pointing of the abscess or by surgical drainage.

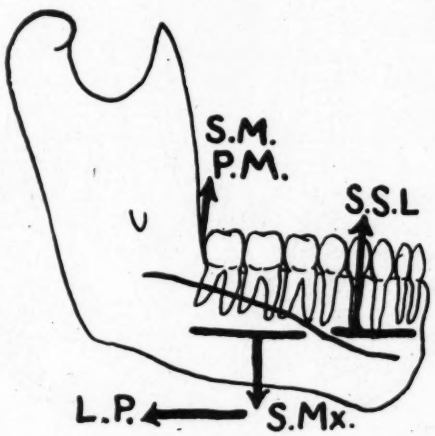
Extension into the Bone—The Haversian canals become engorged and the nutritional supply to the bone is impeded or stopped. Death of bone cells may follow; if the local defense mechanism is good there will be a localized osteomyelitis. The pus, guided by the leucocytic barrier, tracks directly to the cortex and discharges under the periosteum. It is the site where this occurs which determines the soft-tissue complications.

Acute Diffuse Osteomyelitis—Should the local defense mechanism fail to localize the infection, acute diffuse osteomyelitis will occur. This condition is characterized by the following symptoms: 1. The marrow spaces and often the inferior dental canal, are filled with pus under pressure. 2. The trabeculae are dead or dying due to lack of nourishment. 3. Perineuritis and endoneuritis of the inferior dental nerve are present accompanied by hyperasthesia in the early stages and hypoasthesia later. 4. Marked lymphadenitis, high degree of toxemia, and temperature elevation of 103° or 104° Fahrenheit. 5. A deep persistent, radiating, throbbing ache, only partly relieved when cortical perforation occurs. 6. Congestion and sogginess of the gingival tissue. 7. Trismus, partial or complete, present when the infection is in the posterior part of the mouth. 8. When the infection has perforated the cortex and is no longer confined within the bone, it is then able to spread into the soft tissues and involve the cellular compartments of the face and neck.

Circumscribed Cellulitis—1. A strong surrounding barrier of reticuloendothelial cells localizes the infection. 2. The contained dying tissue cells liquefy to form an abscess. 3. Pus continues to collect under pressure and if it does not quickly find its way to the surface it may be forced into the musculofascial planes. 4. It is highly important to decompress the abscess as soon as pus is known to be present. 5. A hot brawny swelling exists in the region involved. 6. Pain is heavy and throbbing, increasing in intensity until the fascial envelope is perforated. 7. Trismus and dysphagia may be present; dysphagia is usually an indication of a parapharyngeal extension. 8. Unless there is poor resistance to the infection the pulse rate shows only a small increase.

Diffuse Cellulitis—1. If the leucocytes are unable to prevent diffusion the infection invades the tissues and fascial planes. 2. Localization does not occur; pus may invade the muscle itself. 3. This condition is termed Ludwig's angina, a bilateral deep sublingual, submental, submaxillary diffuse cellulitis. Mechanical obstruction to the blood supply and lymphatic drainage may lead to gangrene of the tissues.

Ludwig's Angina—1. The tissues are absolutely board-like with (a) no area of softening and (b) no particular redness. 2. The floor of the mouth is bilaterally swollen, the tongue may protrude if the trismus is only partial. 3. Dysphagia is always present because of (1) obstruction of the pharynx by the swollen tongue, or (2) backward extension of infection causing edema of the glottis. 4. Pain is dull, heavy, and frightening. 5. Toxic and febrile conditions are marked.



5. ***Diagram to show the influence of the attachment of the mylohyoid muscle on the direction taken by infection. For Code, see Fig. 4.***

Differential Diagnosis

Pain—1. As the exudate collects under pressure, the pain increases until the fluid tension is relieved temporarily by perforation of the cortex. 2. Pain in acute apical infection is of a localized lancinating character; in osteomyelitis it is diffuse, deep, gnawing. 3. The neuralgic pain in acute maxillary sinusitis may be mistaken for that of an acute abscess in the maxilla.

6. *Schematic transerve section of the maxilla showing pathways of infection in the molar region.*

Swelling of the Soft Tissues—A rapidly formed swelling in or about the jaws may be mistaken for a dental abscess, especially when there are carious teeth present.

Intra-oral Swellings—1. A soft swelling in the sulcus or the palate may be confused with a neoplasm, but following incision (1) no free pus is obtained, (2) hemorrhage is often brisk, and (3) healing is protracted. 2. An infected dental cyst sometimes presents a clinical picture resembling a dental abscess. 3. When the deep lingual space is involved as it is in Ludwig's angina the tongue as a whole is elevated.

Extra-oral Swelling—1. When pus has just perforated the cortex of the bone a soft concomitant swelling becomes hard and brawny as the infection spreads through the soft tissues. 2. In Ludwig's angina the entire submandibular region is absolutely boardlike. 3. Recognition of this is essential because treatment must be vigorous and decompression undertaken without waiting for abscess formation. 4. An angioneurotic edema may be mistaken for an early acute abscess particularly when the cheek and eyelid are involved and carious teeth are present. 5. A submasseteric abscess and acute parotitis may be confused. In epidemic parotitis a mistaken diagnosis is possible in the early stages. 6. Fracture of the jaw may be the cause of painful rapid swelling with little or no displacement visible. 7. In lymphadenitis the swollen gland is usually well localized. (1) Infected tonsils, and (2) chronic otitis media, should be excluded when cervical adenitis is present.

Febrile Symptoms—In conjunction with clinical symptoms, temperature and pulse rate are of great assistance in diagnosis.

Loose Teeth—1. If pus is welling up around it a loose tooth may be involved in a pre-existing osteomyelitis. 2. A loose tooth involved in a soft swelling in the upper jaw may be a sarcoma of the maxilla or a carcinoma of the maxillary sinus.

Trismus—This may be reflex or inflammatory; is always present in infections of the posterior part of the mouth, and is of small diagnostic value.

Dysphagia—With all lateral pharyngeal abscesses.

Treatment

The following rules are common to all stages of the infection:

Drainage—A basic and fundamental principle, drainage may be obtained by (1) opening the pulp chamber, (2) extracting the tooth, (3) opening the socket, or (4) incising the soft tissues.

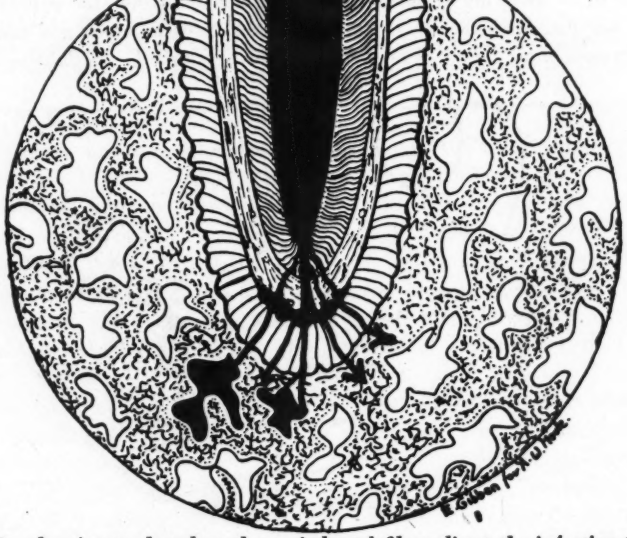
Chemotherapy—A useful adjunct, chemotherapy makes it possible to arrest the infection in the initial stages, but chemotherapy is not a substitute for drainage when pus is present.

Rest—Immobility of the part involved is always advisable as well as rest for the patient.

Adequate Fluid Intake—Not only is dehydration avoided but when using the sulphonamides adequate fluid intake is significant in preventing blockage of the renal tubules.

Sedatives—To control pain the following sedatives may be used: (1) codein, (2) aspirin, (3) barbiturates, and (4) morphine.

Penicillin Therapy—(1) Until the infection is well-controlled and the temperature has been normal for forty-eight hours, 200,000 units of penicillin may be given 12-hourly intramuscularly, and (2) in severe infections the dosage and frequency may be doubled or trebled.



7. *A line drawing to show how the periodontal fibers direct the infection towards the bone spaces. P.M. Periodontal membrane.*

Treatment of Specific Infections

Acute Pericoronitis—1. Frequent thorough lavage and the prevention of further trauma to the gingival flap is usually sufficient. 2. Extraction of the involved tooth should be deferred until the acute symptoms have resolved. 3. For marked extension into the surrounding soft tissues prescribe penicillin at once.

Acute Periapical Infection—The proper use of chemotherapy combined with well-timed drainage will prevent (1) spread of infection, and (2) extension of infection by continuity.

Cellulitis—1. If the patient is seen for the first time suffering from cellulitis, institute chemotherapy at once, prescribing according to the severity of the infection. 2. If the temperature continues to be raised and the condition deteriorates in spite of penicillin, give sulphamethazine because the causal organism may be penicillin-resistant. 3. Defer operative interference until the pus has localized. 4. As soon as the presence of pus is detected, visualize its probable location without delay and incise the most dependent point. 5. Drainage tubes may be employed to prevent immature coaptation of the tissues. 6. The dental focus should be treated as previously indicated. 7. In brawny cellulitis associated with virulent maxillary infections great care must be exercised to prevent the dispersion of septic thrombi into the pterygoid plexus or the angular vein.

Acute Osteomyelitis—1. Penicillin therapy combined with surgery enables excellent results to be obtained in weeks instead of months as formerly. 2. Intensive penicillin therapy must be started as soon as the case is seen and any periosteal swelling should be incised. 3. When the acute stage is controlled and the accompanying external abscess has localized, effect drainage and remove the causal tooth.

Ludwig's Angina—1. Chemotherapy should be given in massive doses as follows: (1) commence with 500,000 units or 1,000,000 units of penicillin intramuscularly, (2) sulphamezathine 2 grams intramuscularly, to be followed (3) by penicillin 50,000 units 3-hourly and sulphamezathine 1 gram 4-hourly. A total dosage of 28 grams of sulphamezathine may be given.

2. When there is still some circulation in the part the condition will respond rapidly; but if there is no improvement in twelve hours, operate.

3. If there is severe respiratory embarrassment commence chemotherapy and incise at once.

4. Should the condition respond to the chemotherapy it will localize; when the abscess has formed it should be drained in the usual way.

5. Hypertonic packs applied to the incision will promote an increased flow of tissue fluids to the part.

6. Kaolin or other moist heat preparations are also useful in assisting resolution.

7. To prevent dehydration give rectal saline until the patient is able to take adequate amounts of fluids by mouth.

Prognosis

1. The majority of acute apical infections resolve without sequel, but in far too many instances this is not because the treatment has been good but because of the excellent blood-supply and the remarkable resistance of the oral tissues to infection.

2. There is a tendency to rely on this power of recovery too much; even when the infection persists and spreads there is often a passive expectancy that nature will bring about the desired resolution unaided.

3. If, in these acute infections, well-timed adequate drainage is established and supported by early chemotherapy in full doses, the prognosis is excellent.

Adapted from *The Dental Gazette* **15**:125-238 (November) 1948 from a lecture before the Royal College of Surgeons.

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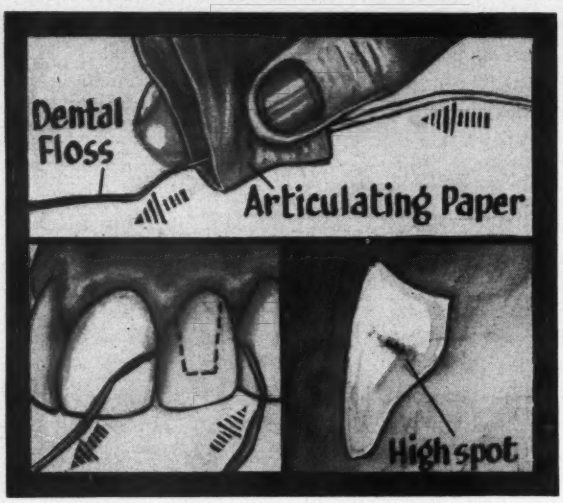


1

Clinical and Laborator

Testing Contacts for Jacket Crowns

Robert N. Ladenheim, D.D.S., Bedford Hills, N.Y.

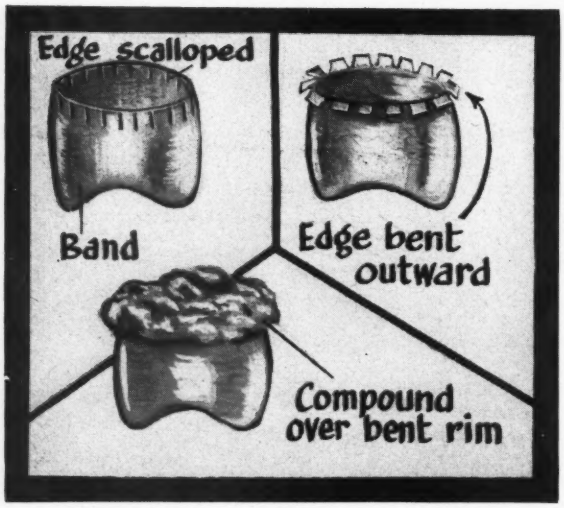
1. To create correct contact points and to avoid breakage in fitting jacket crowns, a piece of dental floss which has been drawn through blue articulating paper is drawn through the contact points when the crown is held lightly in place. The marks produced are then trimmed until the jacket goes to correct position.

2

Testing for Pulpal Response

Benton Kutler, D.D.S., Omaha

2. Revolving a rubber prophylactic cup on a dry tooth offers a convenient, controlled, and accurate manner of testing for the degree of pulpal degeneration. It is better than other methods of heat tests in that it can be easily confined to one tooth and the degree of heat readily controlled.



3

Full Crown Impression Technique

F. Di Giorgi, D.D.S., New York

3. Contour a copper band to fit the preparation. In order to permit easy removal of the band after the impression has been taken cut small slits around the occlusal edge of the band and turn them at right angles. When the compound is inserted have it overlay the slits. After chilling, the firm ridge around the edge of the band affords a grip that makes withdrawal easy.

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SUGGESTIONS . . .

Handy Catch Basin for Gold Grindings

A. H. Horowitz, D.D.S., Brooklyn

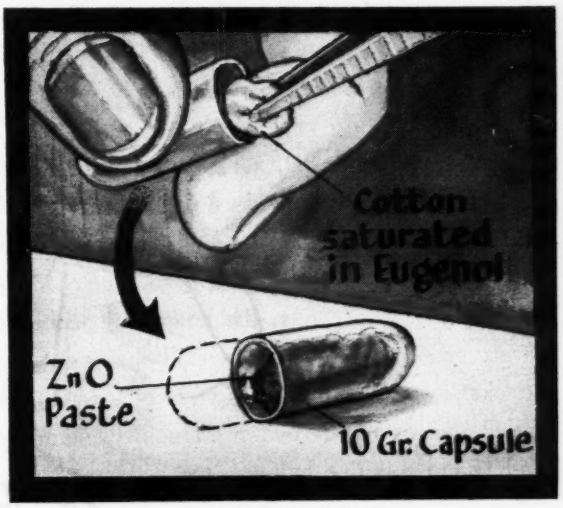
4. A handy catch basin for gold grindings may be made by piercing a hole in each end of a kidney shaped basin. A tape is fastened so that it fits around the neck of the operator. The gold grindings are caught in the basin.

4

A Method to Keep Zinc Oxide-Eugenol Mix Plastic

E. J. Berens, D.D.S., Hammond, Indiana

5. Place a few pellets of cotton saturated with eugenol in a 10-grain celluloid capsule. Place some zinc-oxide paste in the capsule. When the capsule is closed, air is excluded and the mix will be kept soft and ready for use.

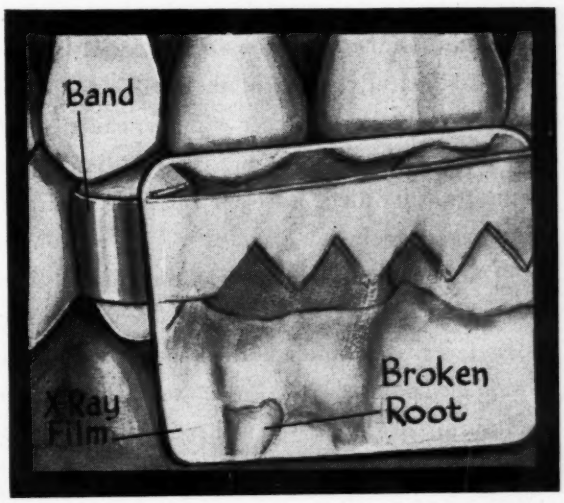


5

A Method of Locating a Retained Root

Frank Hackmyer, D.D.S., Kew Gardens, N.Y.

6 Cut serrations on a strip of metal. Adapt the metal around the tooth closest to the area of the root fragment or foreign body and allow the serrated portion to project over the area. With the metal in position the exact location of the retained root or foreign body may be determined by comparing with the serrations.



6

suitable illustrations; write a brief description of the technique involves; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 426 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

ANALOGIES have been made that compare the body with a machine. Although there are mechanical principles included in the structure and function of the body, we cannot be explicit and call the body an actual machine. No machine regulates and repairs itself. Machines may make adjustments and function in low or high degrees of efficiency, but they are not self-regulating and self-repairing. The body, through the mysterious autonomic nervous system and unseen chemical forces, controls its own affairs without the external supervision of an engineer. When a part or an organ begins to misbehave and go out of function, it is often necessary to call upon the services of the biologic engineer—the dentist or the physician. In such cases he serves to aid the body to return to balance—he is a helper, not a creator.

The body is both a delicate and a robust organism. It can be destroyed by microscopic bacteria and submicroscopic viruses; by pinpoint hemorrhages and thrombi; and by the unhinging of the fine chemical adjustments. Conversely, the body may withstand severe external trauma and overwhelming internal attacks. The delicate balance of body function was called *homeostasis* by Walter Cannon. The more we understand this fine balance, the better and more intelligently we may evaluate the imbalance of disease. An excellent description of *homeostasis* in its relationship to malignant disease has been made by McGrady [1] of the American Cancer Society:

"Paradoxically, most of the methods and substances used to treat cancer will also cause cancer.

"These include x-rays and other radiation, hormones, special diets, nitrogen mustards, hydrocarbons and several other chemicals.

"Some research scientists feel that normal tissue is the product of a well-balanced body chemistry. Some feel that when the normal chemical processes within the body are upset—when some foods cannot be transformed into tissue and energy and when replaced tissue will not break down and slough off—cancer results.

"This unbalance may be caused by many factors. The enzymes, which, like traffic policemen, direct the orderly metabolism of food into body substance and strength and dispose of waste; chemicals, like hydrocarbons which used to cause so many skin cancers among chimney sweeps; hormones—male, female and other steroids which are secreted internally by glands and control such functions as growth and reproduction; the alteration of genes—the units of heredity—in sex cells; and many others. The wayward cancer cell may be a perfectly normal cell subjected to improper nervous or chemical stimulation.

"Most research scientists say that until at least some of the mystery surrounding these factors is broken down, a well-planned assault against cancer is impossible. They contend that the cause, mechanism and cure of cancer lie in knowledge of the life processes of the normal and abnormal cell. They concede that an accident may happen—that a universal cure for cancer may be stumbled upon—but most scientists would not give that possibility serious consideration.

"Consequently a great deal of basic research is directed at finding out what goes on within the living cell."

Basic biologic research gives the greatest promise toward solving the riddles of cancer and all forms of disease. As part of our dental training we should indoctrinate more and more young men and women in the methods of research and inspire them to become investigators. We should also be prepared to assure them a sustained and assured career with an income comparable to those received by practitioners. Research carries with it a dignity and aura of the spectacular and the mysterious. This isn't enough. The people who do research must be assured economic security and tenure. Until society makes such guarantees many brilliant investigators will be lost to science and to the suffering world.

[1] McGrady, Pat: Body Chemistry in Delicate Balance, *Montana Health* (November-December) 1948.

MEDICINE and the Biologic Sciences

Poliomyelitis

Of special importance to dentists is an enlightening discussion on the present concepts of poliomyelitis presented recently by Doctor Arthur C. Guyton. His comments were based on extensive research and observations noted while undergoing a severe attack of the disease.

It is relatively certain that poliomyelitis is caused by a small virus which is extremely hardy and resists many of the disinfectants. It can live for long periods at low temperatures. It exists abundantly in sewage during the times of epidemics and is widespread among the populace.

Because of the nature of the virus much difficulty is experienced in attacking it. Sterilization of air, water and food supplies as well as treatment of the actual infection is yet beyond our medical ability.

The incubation period is stated to be from five to thirty-five days. The average is probably about two weeks. The epidemiology of poliomyelitis is greatly complicated by the fact that for each one who shows neurogenic symptoms many persons have gastrointestinal poliomyelitis. (All these persons unknowingly transmit the disease.)

There are many indications that during epidemics poliomyelitis is spread principally through the respiratory tract rather than through food supplies. It has been shown that epidemics usually spread in concentric circles from the point of origin rather than over widely separated areas, a fact entirely consistent with respiratory spread rather than with gastrointestinal spread.

The age of incidence of poliomyelitis is much lower in urban areas than in suburban areas. The prevalence of the disease in the United States has greatly increased in the last few years. As sanitary conditions become better it seems that the prevalence of poliomyelitis increases. Also the relative incidence among older persons rises.

The rising incidence of the disease among older persons may be due to the fact that there is considerable cross immunization between poliomyelitis and other diseases. Therefore, as other diseases are conquered, many of the immunizing antigins of childhood are removed, and the body becomes more susceptible to poliomyelitis.

Regardless of how poliomyelitis enters the body a preliminary infection of the lymphoid tissue in the nasopharynx and the gastrointestinal tract occurs prior to infection of the nervous system. Usually the virus enters the brain along the axons of nerves. The point of entry into the central nervous system depends on which nerve the virus traverses in its course from the gastrointestinal tract or nasopharynx.

Once the poliomyelitis virus enters the nerve trunk, approximately eleven hours lapse before the virus spreads at all. After that time it travels up the nerve at the rate of approximately 2.4 millimeters per hour.

The spread of the virus through the brain is governed by several factors: 1. Certain areas are susceptible and certain areas are resistant. 2. The only areas of the central nervous system which are destroyed sufficiently to cause permanent symptoms usually are the anterior horns of the cord. This produces the well-known paralysis. 3. The more virulent the virus the farther it is likely to spread. 4. The susceptibility of persons is also different. 5. Fatigue, local neuronal immunity, humoral immunity and individual idiosyncrasies have much to do with the spread.

Certain muscles of the body, such as the deltoid and the anterior tibial muscles, appear to be more susceptible to paralysis than other muscles. The most important symptom is undoubtedly the flaccid paralysis due to destruction of anterior horn cells. The paralysis is due to actual death or inactivation of motor nerves from the spinal cord to the muscle.

Atrophy of muscles in poliomyelitis begins to occur immediately after onset of the disease continuing rapidly for the first four months and then slowly over a period of several years. This atrophy is due to disease and to lack of trophic impulses from the degenerated nerve fibres.

Recovery takes place in three phases: 1. Recovery in the spinal cord. 2. Recovery of the peripheral nerves. 3. Recovery of the muscles. The ultimate of recovery cannot be predicted because the relative amount of paralysis that is due to reversible and nonreversible neuronal damage is unknown. In some cases virtually all lesions are nonreversible. Little recovery can therefore be expected.

Guyton, Arthur C.: Reaction of the Body to Poliomyelitis and the Recovery Process, Arch. Int. Med. **83**:27-47 (*January*) 1949.

Periodic Diagnosis of Infant Development

The purpose of the periodic examination of infants and young children has become more significant because of a growing realization that these infants develop both mentally and physically as a unit.

In 1947 there were almost 4,000,000 babies born in the United States. By 1950, infants and children under fifteen years of age will be the largest

single population group in the country.

The United States Public Health Service reports that there are now at least 30,000,000 persons in the United States who require some form of mental hygiene. Mental indisposition is distributed as follows: (1) 5,000,000 suffer from psychoneuroses, (2) 2,500,000 have character and behavior disorders, (3) 1,500,000 are mental defectives, (4) 500,000 are epileptics, and (5) 20,000,000 or more have borderline or transient emotional disturbances.

With the annual increase in population it is easy to recognize the immensity of the problem. It is estimated that only one out of twenty persons with psychoneuroses now receives psychiatric treatment.

Many practitioners are turning to the newborn with a monistic approach which recognizes the interaction of body and mind. Such a premise includes three propositions: 1. Development is the supreme function of the organism because it sums up all other underlying processes. 2. Health from a dynamic standpoint must be defined as that condition which permits and promotes optimal development. 3. Development as well as disease falls within the scope of clinical medicine.

The pediatrician has long recognized the importance of periodic check-ups during the first years of life when life is most basic and most rapid. The developmental status manifests itself in three kinds of signs and symptoms: (1) anatomic, (2) physiologic, and (3) behavioral.

First and foremost, attention is given to the infant's nutrition. This is at is should be. His weight, height, girths, body proportions, somatotype, growth rate, tonus, metabolism, and allergies all furnish important anatomic and physiologic evidences of developmental status. The increasing refinements of biochemic and electrometric methods and micromeasurements are destined to improve the somatic appraisals of growth conditions.

However, behavior will always remain the most inclusive and sensitive indicator of developmental status. The infant is a unitary action system which reveals itself lawfully in patterns of behavior. His behavior characteristics and capacities infallibly indicate the maturity of his neuromotor equipment. Behavior expresses the achieved efficiency of his total organism.

Behavior is difficult to appraise. Systematic methods of interview, observation, and diagnosis are necessary. Standard techniques adapted to persons and age differences are being developed. In the meantime it is wise to observe all children periodically.

Well-placed periodic developmental appraisals during the first years of life are indicated for relatively normal children as well as for those who are not developing satisfactorily. By extending the concept of developmental supervision to all infants we shall be in a better position to individualize child care and to attain the goals of a preventive mental hygiene program.

Gesell, Arnold: The Periodic Diagnosis of Infant Development, J. Michigan M. Soc. **48**:185-189 (*February*) 1949.

Intoxication With Vitamin D

Vitamin D has been and is being used in massive doses for the symtomatic relief of arthritis. Many observers report cases of definite improvement of joint symptoms during a period of vitamin D administraton.

There is considerable danger in unregulated therapy of this type. It is now known that serious damage may result from the use of large doses of vitamin D. The outstanding symptoms of intoxication from these vitamin compounds are (1) fatigue, (2) weight loss, (3) anorexia, and (4) vomiting. Impairment of (a) renal function and (b) degenerative lesions with vicarious calcification are prominent clinical signs.

The symptoms and signs are similar to those noted in hyperparathyroidism. Therefore it is believed that hypercalcemia is responsible for depositions of lime salts in areas of vicarious calcifications. It may be the prime cause of renal insufficiency.

Intoxication from vitamin D, like hyperparathyroidism, seems to induce a situation wherein more than the normal amount of physiologically active calcium is carried in the serum. A rise in the total and physiologically active components of the serum calcium follows even though minimal quantities of calcium are present in the diet. It seems likely that the bones are the major source of the excess calcium in the serum.

Reversibility of the damage is of great interest. All observers agree that the sooner the manifestations of vitamin D intoxication are recognized and the drug withdrawn, the more likely will be complete recovery in only a few cases. Renal damage is noted in an inability to form highly concentrated urine or a reduction in PSP (phenol-sulfa-phthalein) excretion. If calcification has occured in the arteries it is unlikely that recovery is complete.

There is great variability in the reaction of different persons to the drug: 1. Clinical evidence of duration of improvement after drug removal is highly variable. 2. Dosage and duration of administration of drugs prior to intoxication seem to rest on factors of individual susceptibility as yet unknown.

It is wise to caution patients to avoid self-medication and to advise periodic examinations to avert any adverse effects.

Howard, John Eager, and Meyer, Richard J.: Intoxication with Vitamin D, J. Clin. Endocrinol. **8**:895-910 (*November*) 1948.

Therapeutic Abortions

The occasional necessity for the interruption of a pregnancy to preserve the life of the mother has been recognized since ancient times. The difficulty of making the distinction between such cases and criminal abortion has always existed. The distinction is dif-

ficult because neither the medical profession nor the legal profession has done much to clarify the issue. Each state in this country has its own legal policy.

In studying the cases of therapeutic abortions performed in institutions in different parts of the country a surprising agreement on most indications is noted: (1) on the ratio of incidence to the number delivered, and (2) on the manner of interruption. In general, the incidence of therapeutic abortion is about 1.23 per cent. This is a ratio of 1 to 76 deliveries.

There are five major groups of indications for therapeutic abortion:

1. Tuberculosis offers the greatest controversy over the problem. There are authoritative opinions for and against abortions in these patients. But it is recognized that at least 40 per cent of the total indications for therapeutic abortions occur because of tuberculosis. This may be due in part to the fact that many tuberculous patients are aborted each year or so.

2. Cardiac diseases provide the basis for the greatest unanimity of opinion. The functional classification is the first essential and the revelation of any history of failure is ominous. Clinicians are quite well agreed as to the risks involved for the various types of cardiac diseases. Therefore, recommendations are much the same in advising or not advising therapeutic abortion.

3. In neurology and psychiatry the trend has swung from comparative liberalism to marked conservatism in the past twenty years. There does not seem to be any one condition in neurology or psychiatry which absolutely calls for interruption. The main features in this group are shown in the high incidence of sterilizations and in the markedly increasing incidence of occurrence.

4. Toxemias of pregnancy and pyelitis are on the decline in most parts of the United States. This is because of (1) the increased availability of antepartum care, and (2) the early treatment of the first signs of the disorder. As a result a decline in the incidence of abortions for this indication has followed.

5. This group includes all other remaining indications. Each is an individual problem and requires the keenest evaluation. Among these are the Rh-negative women already immunized from preceding pregnancies which have resulted in one or more erythroblastic infants with fatal forms of the disease and where husbands are such as to exclude the possibility of an Rh-negative infant. Also the mothers who have rubella in the early months of pregnancy are considered here. Most of their infants show severe congenital anomalies.

Operative procedure is the method of choice for interruption of pregnancy. The mortality compares favorably with other surgical procedures. The indications for all therapeutic abortions are on the decrease, whereas the number of deliveries with the same medical complication is on the increase.

Perlmutter, Irving K.: Analysis of Therapeutic Abortions, Am. J. Obst. & Gynec. **53**:1008-1012 (*July*) 1947.

Prompt Action in "Strokes"

Cerebrovascular accidents now are the tenth largest cause of death. In spite of this it is a mistake to assume a fatalistic attiude toward these accidents.

In the case of patients with "strokes" procrastination is no longer justified. The commonly accepted belief that cerebral hemorrhage is caused by a sudden rupture of a large vessel with extensive and irreversible damage to brain tissue is being questioned. Some men maintain that brain tissue is gradually rendered bloodless by impairment of blood supply. The resulting lack of oxygen causes reflex dilatation of the vessels of the area and the production of edema fluid.

A chain reaction of further deprivation of blood supply is initiated, until occlusion of a good-sized cerebral vessel occurs as an end result. This preliminary process is identical in hemorrhage or permanent occlusion of a vessel. The difference depends on whether or not the collateral circulation fills the paralyzed vessel, with a consequent transudation of blood. If the vessels are not filled there is a permanent bloodless area.

In most cerebrovascular accidents some brain tissue is completely destroyed. However, a much larger area merely ceases to function temporarily. It is in this situation that well-guided and prompt therapy may prevent extensive permanent disability.

To minimize cerebral damage, prophylactic treatment should be started at the first sign of mental or neurologic disturbances. Cerebrovascular accidents may be postponed by (1) restriction of exercise, (2) the correction of excesses in eating, and (3) the restriction of alcohol and tobacco. Vasodilating medications may be adivsable.

Following a vascular accident, prompt, vigorous therapy is indicated. Such therapy includes (1) measures to diminish cerebral edema, (2) to combat protein deficiency in the blood stream, and (3) to regulate salt metabolism. Sometimes surgical evacuation of clotted blood from the brain may be of value. This is true in young and middle-aged patients.

Physical therapy, including massage and active and passive motion is useful. In some instances rehabilitation therapy is necessary for the ultimate return of physical function.

Medical Review: Prompt Action Recommended in Treating "Strokes," Hospitals **23**:83 (*January*) 1949.

Fenestration

The success of fenestration operations for the purpose of restoring hearing to the deaf has been held in question for some time. This was due to the relapses which occurred after the first year. Approximately 25 to 30 per cent of the cases suffered relapse. Such relapses probably were due to bone regeneration and to the presence of crumbs and splinters dropped into the labyrinth.

Doctor Julius Lempert has modified his procedure with a notable de-

crease in the number of relapses. He introduced a dust free technique and devised a way to burnish the cut edges with lead.

Fenestration, if successful restores hearing to a conversational level of 30 decibels without a hearing aid. Function should first be determined by an otologist.

An old fashioned speaking tube is used to test the intelligibility of speech. An audiometer and steel tuning fork are used to test pure tone in bone conduction hearing.

The object of fenestration surgery on the ear is to make an artificial opening, usually in the shape of an oval window in the labyrinth. Formerly this opening was made by an electrically driven bur. Now it is eroded by a 1 millimeter dental polishing bur. Then it is cut out with a knife. This avoids the possibility of bone dust falling into the perilymph space and inner surfaces of the labyrinth.

Lead burnishing has been used in 800 consecutive cases since December of 1947. Of 170 patients observed more than one year after surgery only five showed evidence of bone regeneration. Another year is necessary in order to give a complete evaluation of the modified procedure. However, it is reasonably certain that the dust free technique will reduce the stimulation of bone regeneration.

Lempert, Julius: Fenestration for Otosclerosis, Proc. Rov. Soc. Med. **61**:617-630 *(April)* 1948.

Vitamin Deficiency— Cutaneous Aspects

Our knowledge of vitamins is still incomplete. It is impossible to a major degree to determine the only vitamin lacking and the extent of this lack. For this reason it is well to use large doses of polyvitamins in all proved vitamin deficient persons.

There are definite evidences of specific vitamin deficiency some of which are in the dentist's realm. Observation of these cutaneous aspects of vitamin deficiency will enable the dentist to render a more complete service to his patients.

A deficiency of vitamin A may be indicated in several ways:

1. Cutaneous manifestations such as the development of hard follicular papules upon the extensor surfaces of the extremeties, particularly about the elbows and knees. The entire body surface may be involved in more severe cases.

2. Generalized xerosis or excessive dryness of the skin of infants and children.

3. The occurrence of callouses and corns without obvious friction or chronic trauma.

4. The appearance of keratosis follicularis.

5. The presence of Bitot's spots, circumscribed areas of xerosis, just lateral to the corneas.

Large doses of vitamin A, varying from 100,000 to 300,000 units per day, orally, over long periods of time are necessary.

Symptoms arising from a lack of vitamin B may be as complex as the vitamin itself. A lack of riboflavin or B produces the following: 1. A cheilosis with fissuring of the oral commissures.

2. A seborrheic dermatitis-like change with erythema and scaling characteristically at the naso-facial folds and auriculo-temporal folds.

3. A rosacea-like dermatosis.

4. There may be a rosacea keratitis and a glossitis with a magenta or reddish purple coloration of the tongue with enlarged papilla producing a roughened pebbly appearance.

The cheilitis must be differentiated from perleche due to licking the corners of the mouth and moniliasis. The latter condition may be ruled out by direct slide examination or culture.

A deficiency of nicotinic acid is the primary factor in producing pellegra, the three D's disease — dermatitis, diarrhea, and dementia. A subclinical form consists of slightly developed erythematous macular lesions upon the exposed surfaces accompanied by some smoothness and swelling of the tongue and buccal mucosa. Treatment of pellegra calls for large doses of nicotinic acid augmented by the entire B complex and vitamin C.

Vitamin B therapy is of some value in the relief of pain accompanying and following herpes zoster and of tabes dorsalis. (Pantothenic acid is not a factor in the graying of hair of the human.)

Vitamin C is the antiscurvy factor. A lack of this vitamin produces reddened, spongy, bleeding ulcerated gums accompanied by purpura. This condition calls for the administration of 100 to 200 milligrams of vitamin C daily.

There are no dermatoses attributed to a deficiency of vitamin D. Some cases of pemphigus, acne vulgaris, and psoriasis do respond to large doses of vitamin D.

The circumstances resulting in the condition of vitamin deficiency are: (1) inadequate intake due to faulty diet, (2) incomplete digestion of food, (3) inadequate absorption in the digestive tract, and (4) increased requirement for vitamins due to such causes as chronic infection, debility, and pregnancy.

Editorial, Cutaneous Aspects of Vitamin Deficiency, Postgrad. Med. **5**:430-431 *(May)* 1949.

Use of Estrogens

Regardless of the type or route of administration the trial method of giving estrogens is used in the majority of cases. This is necessary to insure adequacy and achieve therapeusis.

Often large doses are required at first. These are changed from time to time and gradually reduced. It is better to give small frequent amounts than larger doses at longer intervals.

There are several methods of administering the estrogens: 1. Oral therapy is used widely as is intramuscular injection with vegetable oil. 2. Occasionally pellets are placed in loose subcutaneous tissue by trocar or through small incisions. 3. Aqueous suspensions of minute crystals may be injected hypodermically

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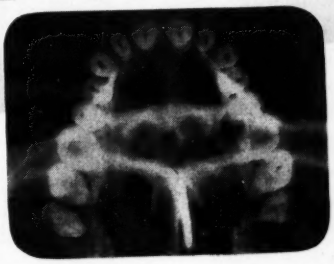

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in small amounts. 4. Vaginal suppositories may be used in selected conditions.

Natural estrogens are usually given intramuscularly, while synthetic hormones which are less expensive than biologic products are equally effective by mouth or parenteral administration. Nausea sometimes accompanies the administration of synthetic compounds.

In women the estrogens bring about (1) myometrial growth, (2) endometrial growth, (3) vaginal mucosal maturity, (4) mammary duct growth, (5) maturity changes in skin and skin derivatives, (6) secondary sex characteristics, and (7) union of the epiphyses of long bones.

In addition, the hormones affect the salt and water balance and inhibit pituitary secretion of gonatropins.

The most common use of estrogens is to alleviate menopausal symptoms. Some of the climacteric manifestations relieved by estrogens are (1) psychic distress (2) osteoarthritis, (3) osteoporosis, and (4) a syndrome resembling thyrotoxicosis. Generous doses taken from the fifth day of flow for the next twenty days help eliminate severe recurrent dysmenorrhea.

Growth of breast tissue and uterine tissue that failed to develop during adolesence may be stimulated by sustained administration of estrogen if the structures are not entirely lacking. The estrogen is given in cycles simulating the natural menstrual cycle.

The control of diabetes by estrogen has been found to be disappointing. Only certain types of breast cancer in older women are treated with estrogen. Therapeutic doses probably do not initiate but may stimulate growth of carcinomatous tissue in breasts.

Excessive dosage is indicated in the resumption of bleeding after menopause or unwanted large breasts as well as subjective tension.

Serringhaus, Elmer J.: Use of Estrogens in General Practice Ann, Int. Med. **29**:595-610 *(May)* 1948.

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The Movies Haven't Grown Up

Bob Hope, if you like him (I don't) plays an itinerant dentist in a picture labelled "Pale Face." The other picture in the exhausting double feature gives the complete history of a woman suffering from an inoperable brain tumor. Not that it makes any difference, but I can't remember the name of that picture. Hope is pure slapstick without the skills of the pantomimist. The documentary of the pathology of the brain tumor is morbid and drippily dramatic and adds nothing to knowledge or entertainment. Mr. Hope's picture, in cooperation with the dubious dramatic talent of the well-pectoraled Jane Russell, is not funny.

The motion picture industry, I gather from what I read, is crying in its celluloid about the unappreciative public who are staying away in overwhelming numbers and are spending their time before the television screens or in the parks and pubs. Unless they are sure of entertainment people are not going to part with seventy-five cents or a dollar to wear out the seats of their clothing watching three-hour double features under the accompaniment of crackling popcorn and rustling confectionery papers.

People who want morbid anatomy and pathology would be better served by seeking a medical library or museum or spending a day in the wards of a large hospital. Mr. Hope, in his antics as a dentist, can blame himself for being the force that kept many impressionable children and some grown-ups from seeking dental care. He and the movie producers can pride themselves for children crying in the night from toothache, for people with ugly swollen faces and unsightly teeth. Something to laugh at, Mr. Funny Men?

Although Hope was caricaturizing the itinerant dentist of other days the motion picture going public is not sharp enough on historical details to distinguish between past and present dental procedures. A good many people still believe that dentists knee people on the chest when they extract teeth, lift them out of the chair with a pair of tongs, roll them on the floor in extreme cases. People have enough fears of the dental experience without suffering a form of aggravated assault by watching Bob Hope clowning the subject.

If the dental profession made a protest we would be told that no offence was intended, that the whole subject was comedy and not to be looked at seriously. We would probably be informed that we lack a sense of humor and that we take ourselves too seriously. We dislike horror cartoons, articles, pictures because they injure

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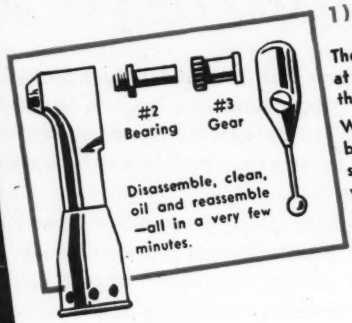

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the American public, not because they hold the dental profession up to laughs. We are wholeheartedly for people laughing. There should be more done. Inculcating fears and anxieties is something else. We are against that. A good many of the acts of violence committed by young people had a possible prototype in some scene in a motion picture. A lot of good dental health education can be rapidly nullified by the atrocity of a Bob Hope. I do not suggest a boycott against pictures like "Pale Face." The putrescence of the picture is powerful enough to keep most people away if they are warned in advance.

The Newspapers are Better

On the other side of the ledger is an example of favorable dental health publicity. This is from the *Providence Journal*. There is nothing stuffy about this writing. It is tinctured with a bright humor. Underneath is a serious note: That no one with self-respect can feel himself adequate or at ease with a front tooth missing.

"Mistress B. Lillie's Chicago apartment caught fire the other night and stirred up such general excitement that the vivacious star had to 'cancel a performance because of shock.' At least that's what the report said. It went on to say casually that while Miss Lillie was groping around in the smoke she bumped into a door and broke a tooth.

"Which is probably the real reason, and a much better excuse for calling off the show—calling off anything for that matter, as anybody knows who has cracked off a precious front tooth groping for a door, chopping kindling wood, biting a peach stone, falling upstairs or indulging any of the other hazards which sooner or later get front teeth.

"It's a great calamity. Nobody can possibly be himself with a front tooth cracked off like a piece of old crockery. He dare not laugh with customary frankness, dare not thay yeth, dare not bite publicly. He must chew on the bias and avoid all public contact. He becomes sheepish, hangdog, painfully abnormal.

"The disaster works backward through the reflex centers into the more select areas which govern conduct. The victim of a broken front tooth will find himself backing up during conversation or swinging away like a weather vane under the influence of cosmic forces. He will vainly try to hide his mouth with his fingers. Out of doors he will often talk through his hat.

"Thousands of illustrious men—ambassadors, lecturers, corporation lawyers who have untimely cracked off a tooth will stay home until the dentist (never busier than at this critical moment) can repair it. If unfairly overtaken by friends or clients they will devise subterfuges. 'Sore throat,' they will write on a pad as an excuse for not opening their lips, or 'Voice gone.' Some will go to opposite extremes, point to the vacancy, laugh uproariously, attempt to carry it off with such extravagance that they make a pathetic failure of the whole act.

"We doubt if there's one person in

In your ORAL HYGIENE this month

Trivial Dentistry

"What has happened to the proud old ideal of 'saving teeth'? Has it been replaced with a subconscious belief that nature created human teeth to serve only as a kind of crop to be harvested with forceps by dentists?"

★ ★ ★

Doctor Howard R. Raper indignantly attacks the selfish, commercial attitude of those dentists who regard restorative dentistry as "trivial." He claims that many society-approved fee scales place a financial premium on extraction and replacement of teeth and thus tend to discourage preventive and restorative treatment. Doctor Raper's articles are always outspoken and interesting. This one is especially so.

★ ★ ★

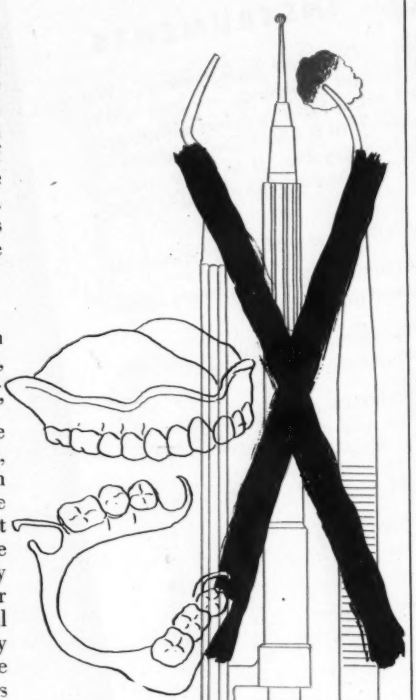
"Trailer Dentist"—School children of Montgomery County, Maryland, receive regular dental care from Doctor Roy H. Bridger, "trailer dentist." The Public Health Lay Council, the Maryland State Health Department, and the Montgomery County Health Department have co-operated to give those children whose parents can't afford to pay for dental service, the examinations and treatment they should have. There is also service for those who can pay only a nominal fee. The success of Montgomery County's plan should encourage the adoption of similar programs throughout the country.

★ ★ ★

"There is a need . . . for some plan to take care of the American people," says Doctor Meyer M. Silverman, in writing of national health care. "The American Medical and Dental Associations should take the initiative and offer a suitable plan to the Congress." He explains in detail a plan which "would maintain the high standards of the professions and answer the real needs of the American people." It is a practical, well-considered suggestion.

★ ★ ★

"The Magnifying Glass in Your Operating Room"—Doctor Charles A. Levinson speaks from experience of the "double aid to dental practice" which a magnifying glass provides by permitting the operator to see detail more easily and by enabling the patient to watch the operation.



★ ★ ★

The University of Illinois Telephone Courses are attracting an ever-increasing number of dental societies throughout the country. Geographic distribution of these "receiving groups" is shown on a double-page map, and details of the program are presented in convenient reference form.

★ ★ ★

In addition to these—and other—articles, there are all of the regular monthly departments and features which give interesting—and valuable—spare-moment reading.

a thousand, in this day when flashing smiles and gleaming teeth are the symbol of perfection, who can carry off this ghastly loss as though nothing had happened. Last Saturday we would have said that the one person who could defy the world with a broken front tooth was Mistress B. Lillie. But apparently even she can't."

Tough on Nurses

I have just seen a dental record chart that is required for entrance to school of nursing. So far as I know there are no such requirements demanded for entrance into schools of dentistry and medicine. The dental health program in the schools of nursing is pretty stiff:

1. Each applicant for admission to the School of Nursing will be given a full mouth roentgenogram consisting of twenty films, including bitewing films, at the expense of the School.

2. At the pre-admission health audit given to each applicant for admission to the School about three months prior to admission each aplicant will have entered on her permanent school record all necessary dental care completed and prescribed.

(1) All cavities filled

(2) All missing teeth and all unerupted teeth

(3) All fillings required for caries pits and fissures

(4) All replacements required for function and occlusion

(5) Recommended dental prophylaxis

3. At the conclusion of the pre-admission health audit each applicant will receive a dental prescription signed by the examining dentist showthe following:

(1) All fillings required for caries pits and fissures

(2) All replacements required for function and occlusion

(3) Recommended dental prophylaxis

4. Each applicant for admission is required at her own expense to comply fully and completely with each item on the dental prescription before she presents herself for the commencement of her residence in the School. *No applicant will be accepted who fails to meet this requirement.*

Announcement

We wish to make it known to the dental profession
that the platinum and porcelain crowns and platinum castings
described in the June issue of Dental Digest
are being constructed at the laboratories listed below:

ORAL ART LABORATORY
25 East Washington Street
Chicago, Illinois

STANDARD DENTAL LABORATORY
OF CHICAGO, INC.
225 North Wabash Avenue
Chicago, Illinois

5. In exceptional cases the Health Director is prepared to offer special counsel.

6. During the month of October in each year every student in the School receives a dental re-examination with a signed dental prescription. This prescription must be fully and completely carried out at the student's expense on or before the first day or the next succeeding January.

7. Each student nurse in the School who has theretofore filed in the Office of the Director of Nursing a notice of her intention to become a candidate for Final Health Honors at Commencement Day shall be given a second dental re-examination in April of each year and shall be required to comply fully and completely with such prescription on or before the first day of the succeeding July.

8. Any student nurse who fails to comply fully and completely with the terms of a dental prescription within the time specified in these Dental Standards shall be subjected to such disciplinary penalty as may be prescribed by the Director of Nursing which may be suspension from the School during the period of noncompliance.

Wouldn't it be tough on us if similar requirements were set up as prerequisites to admission and graduation from dental colleges? How many practicing dentists can pass a test that requires that all restorations be made to restore their mouths to function and occlusion? How many have periodic x-ray examinations, how many dentists receive regular prophylactic care? Come to think of it, one of these days I am going to get a dental appointment—maybe. —E.J.R.

Glossitis

Alexander Brown, M.D., F.R.F.P.S., M.R.C.P.Ed., Glasgow, Scotland

1. Glossitis is recognized as a common feature of Addisonian pernicious anemia.

2. Some evidence of involvement of the tongue is obtained in about 70 per cent of cases.

3. Adequate treatment with potent liver extract usually results in the disappearance of oral symptoms.

4. Glossitis is also a common feature of the sprue syndrome and of many deficiency states, such as pellagra.

Clinical Observations

Seven patients with pernicious anemia exhibited a well-marked disturbance suggestive of deficiency of one or more members of the vitamin B complex. The diagnosis of pernicious anemia was made on the following grounds.

1. In all cases the clinical picture was compatible with the diagnosis.

2. All had a macrocytic anemia with a megaloblastic bone-marrow reaction which showed a satisfactory response after treatment with highly purified liver exract.

3. All had a histamine-fast achlorhydria.

4. In none was there evidence of a steatorrhoea or dietary defect.

Case One

History—1. A man of 58 developed pernicious anemia for which liver therapy was given. 2. His tongue was red, glazed, and smooth but did not become painful until four months later. 3. Blood levels were maintained for six months above 4,500,000 red cells per cubic millimeter by regular administration of anahaemin.

Treatment—Two hundred milligrams of nicotinic acid daily for seven days left the condition of the tongue, if anything, worse. 2. One hundred milligrams of calcium pantothenate was then given intramuscularly followed by 100 milligrams daily by mouth.

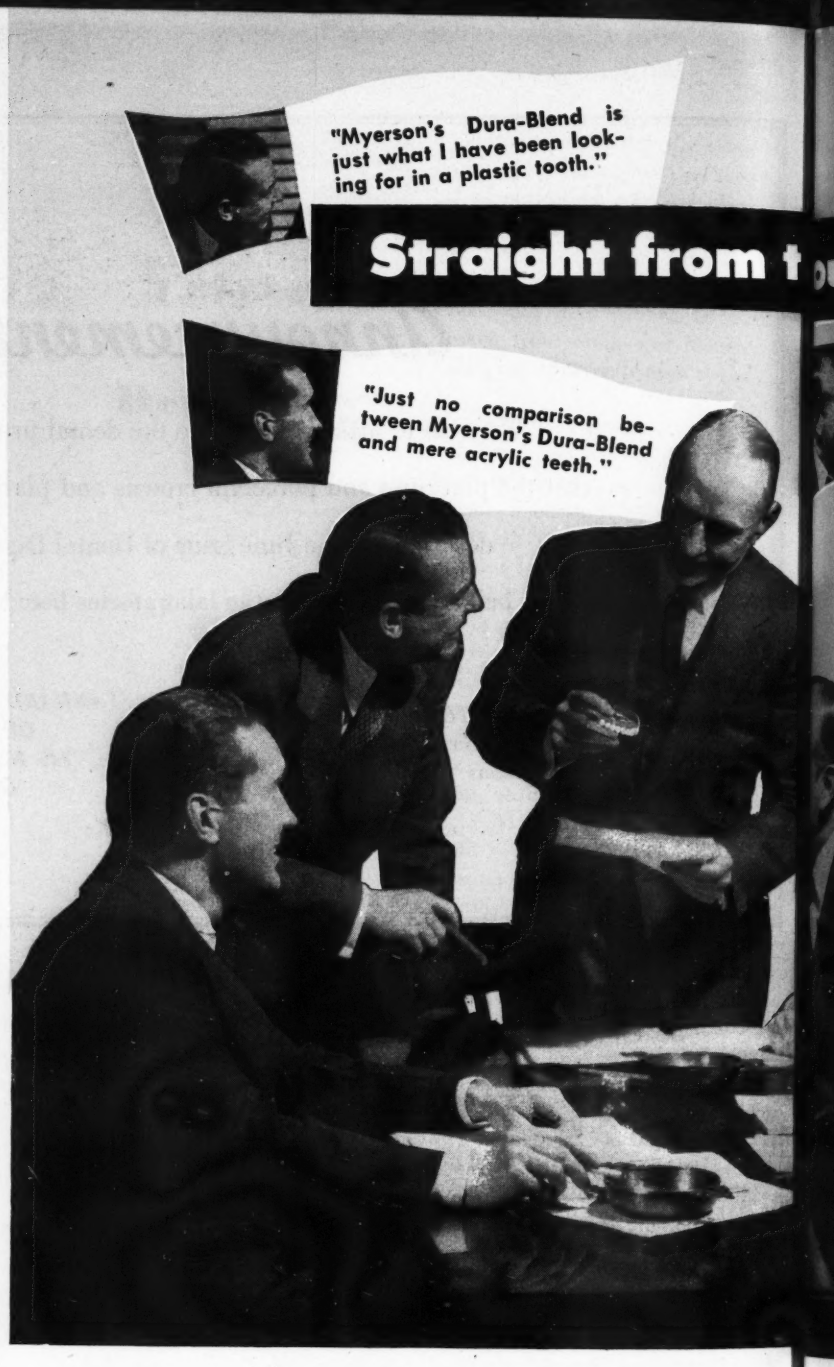
Results of Treatment—1. By the third day discomfort had disappeared. 2. At the end of a week only slight redness at tip remained. 3. After two weeks the tongue was clean and atrophic; calcium pantothenate was then stopped and routine liver therapy given.

Recurrence—Within two weeks lingual discomfort had returned and within three weeks the tongue had become diffusely red, painful, and deeply fissured.

Treatment Repeated—1. Dosage of 100 milligrams of calcium pantothenate was given by mouth. 2. By the fourth day undue discomfort could not be provoked even by hot foods, or by deliberate friction against the teeth. 3. In seven days objective evidence had almost entirely disappeared and approximately three weeks later the tongue looked more nearly normal than at any time since the patient had first been seen. 4. Treatment with pantothenate was discontinued and a year later there had been no recurrence of the glossitis.

Case Two

History—1. A married woman of 40 had received liver therapy for two years when the tongue became red and extremely uncomfortable. 2. When seen in February, 1946, blood values had been maintained for two years at normal levels (between 4,800,000 and 5,570,000 red cells per cubic millimeter).


"Myerson's Dura-Blend is just what I have been looking for in a plastic tooth."
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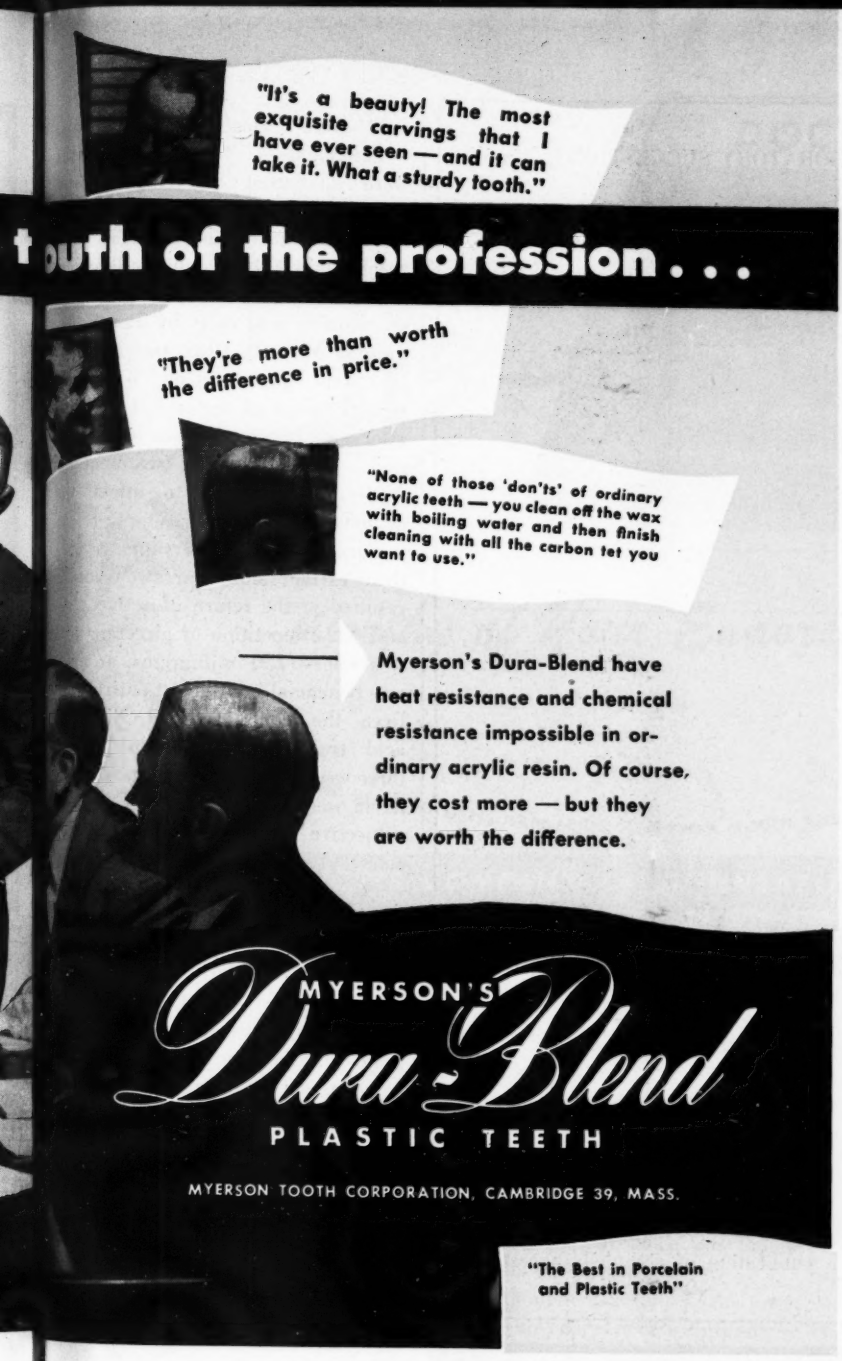
Treatment—1. From February 23, in addition to regular administration of highly refined liver extract, 300 milligrams of nicotinic acid was given daily by mouth. 2. By April 13 the only visible abnormality was slight marginal redness but the tongue was still uncomfortable and unduly sensitive to hot foods. 3. Continued treatment brought no further relief; nicotinic acid was therefore stopped after two weeks, although the liver extract (anahaemin) was given regularly.

Recurrence—1. By August 24 severe general glossitis was present. The patient was immediately given 100 milligrams of calcium pantothenate daily by mouth for seven days when the tongue again appeared normal and treatment was stopped. 2. At the beginning of November symptoms returned and within three weeks severe marginal glossitis was present. 3. From this date the patient was given 100 milli-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grams of calcium pantothenate daily by mouth. 4. Again, improvement was immediate and gradual and by the fourteenth day the tongue was smooth and atrophic. 5. Treatment was stopped and two months later there had been no return of symptoms.

Case Three

History—1. A man aged 61 had received liver therapy for pernicious anemia for nine months. His tongue had been normal in appearance and sensitivity during this period. 2. In spite of continued regular treatment and in the presence of unchanged blood values above 4,300,000 red cells per cubic millimeter, in June 1946 he developed a severe glossitis. 3. The tongue remained diffusely affected until August 24 when 100 milligrams of calcium pantothenate was given daily by mouth.

Improvement — 1. Within forty-eight hours great subjective improvement was noted. 2. At the end of a week the tongue was not even unduly sensitive and it was normal in appearance. 3. Calcium pantothenate was stopped ,and up to March 15, 1947, there had been no return of symptoms.

Case Four

History—1. A married woman of 58 had had a sore tongue before liver therapy was instituted for pernicious anemia. 2. The tongue continued sore during maintenance treatment which kept blood levels above 4,500,000 red cells per cubic millimeter. 3. On June 7, 1946, after two years' observation and treatment, the tongue showed severe marginal glossitis with numerous sharp fissures.

Treatment—1. The patient was given 100 milligrams of calcium pantothenate intramuscularly. Within forty-eight hours discomfort had disappeared and within a week signs had almost completely disappeared. 2. Routine liver therapy failed to sustain this improvement; five weeks after pantothenate had been stopped the tongue had returned to its former condition. 3. A further 100 milligrams of calcium pantothenate was given intramuscularly. Within a week active glossitis had disappeared and by November 2 active glossitis was again fully established. 4. From this date 50 milligrams of calcium pantothenate was given daily by mouth. 5. By the seventh day symptoms had disappeared and treatment was stopped. Conditions in the mouth remained unchanged for almost a year.

Third Recurrence — In October. 1947, active glossitis again appeared in spite of (1) continued regular administration of liver extract, and (2) blood levels above 4,500,000 per cubic millimeter. Within forty-eight hours a simple dose of 50 milligrams of pantothenate intramuscularly was effective and on the seventh day redness had disappeared, but the tongue was atrophic. There had been no return of symptoms up to May. 1948.

Case Five

The patient was a woman, aged 73 with pernicious anemia associated

CLINICAL AND LABORATORY SUGGESTIONS

(*See pages* 410 *and* 411)

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with severe glossitis and stomatitis.

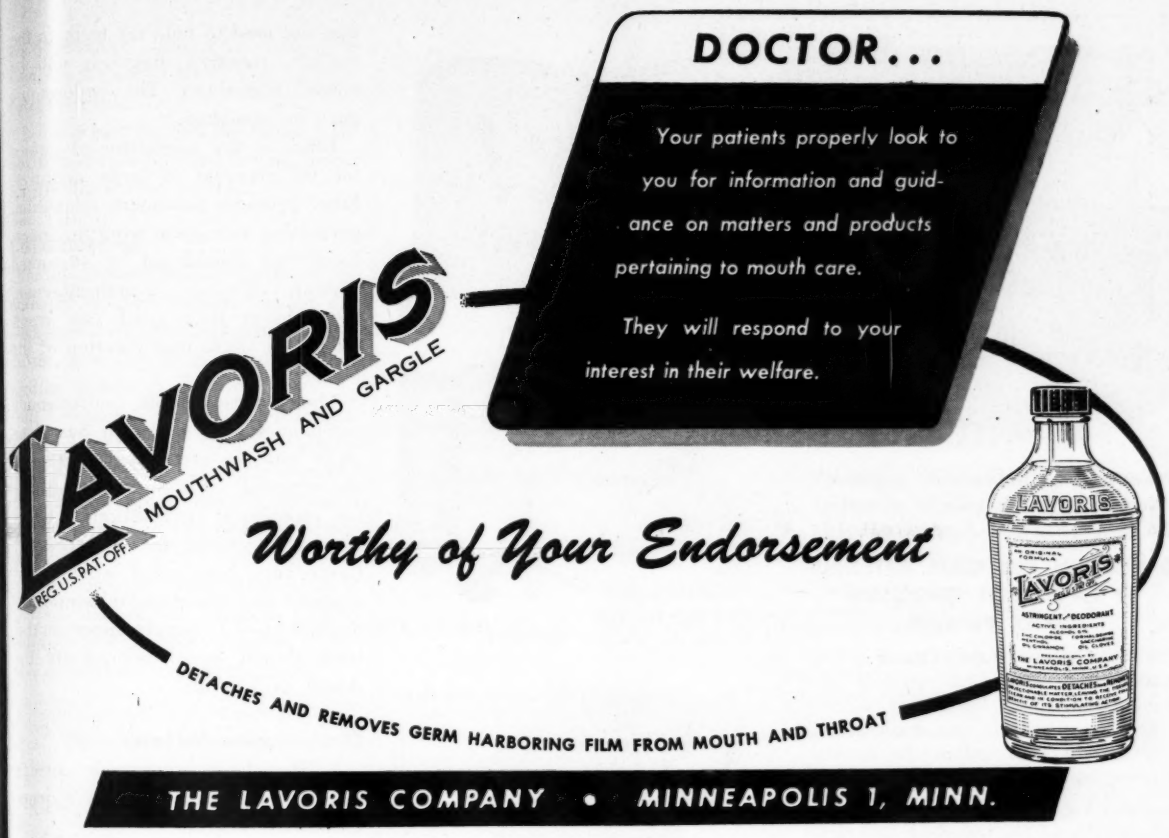
Treatment—1. The oral features were unaffected by liver therapy and throughout the period of observation the red cell levels failed to reach 4,000,000 per cubic millimeter. 2. Administration of 150 milligrams of nicotinic acid daily by mouth, beginning May 10, 1945, was followed by great improvement. 3. Within fourteen days all discomfort had disappeared but the tongue was atrophic. Continuation of treatment for four months failed to affect the atrophy.

Recurrence — 1. Treatment with liver extract alone for two months resulted in the return of active glossitis. 2. Repetition of nicotinic acid treatment (150 milligrams a day) was beneficial but did not entirely relieve the condition. 3. Nicotinic acid treatment was stopped after three weeks and 5 milligrams of riboflavin was given daily. 4. Complete subjective and objective evidence of active glossitis disappeared within a week. 5. Treatment was stopped; within four months the symptoms had returned. Calcium pantothenate given intramuscularly did not affect the glossitis which became more severe. 6. Administration of 5 milligrams of riboflavin resulted again in complete subjective and objective recovery within a week.

Case Six

History—The patient, a woman of 58, had pernicious anemia. She had been troubled with a sore tongue for two years.

Treatment—1. Liver extract treatment was stopped and 50 milligrams of calcium pantothenate was given daily by mouth for seven days without benefit. 2. After a seven day period of observation riboflavin was given in doses of 5 milligrams daily for a week, again without benefit. 3. Thereafter nicotinamide in daily doses of 200 milligrams for two weeks resulted in some aggravation of the glossitis. 4. Folic acid was then given by mouth in doses of 20 milligrams a day. Marked relief was obtained in seven days and in fourteen days the tongue was normal. 5. In three months when the blood level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was normal, folic acid was discontinued. 6. The tongue became unbearable and active glossitis gradually progressed until liver therapy was begun. 7. Thereafter both anemia and glossitis remained adequately controlled.

Case Seven

History—1. A woman of 61 relapsed when liver therapy was discontinued after being applied five years. 2. During recovery with administration of 4 milligrams of anahaemin and having a red cell count of 3,410,000 per cubic centimeter she developed a severe bilateral angular stomatitis involving (1) the mucocutaneous junction, (2) marginal glossitis, (3) vascularization of the cornea in the upper and outer quadrants, and (4) severe conjunctivitis.

Treatment—1. Riboflavin was begun on December 28, 1946. 2.The angular stomatitis and the conjunctivitis improved in a week; by January 25, 1947 the corneal change was seen to be receding. 3. By the middle of February the oral features and the eyes were normal. 4. Riboflavin was discontinued after a short time. There was no return of symptoms.

Results of Treatment

1. No single substance was found to be effective in all cases.

2. Although consistent results were obtained in one patient with a single vitamin for periods up to fifteen months (Case 4) in another instance (Case 5) different vitamins were effective at different times against apparently similar lesions.

3. The role of pantothenic acid in human nutrition is not yet fully understood. The situations described here are believed to be the first in which this substance has been found to influence symptoms in pernicious anemia .

Summary

1. Seven patients with Addisonian pernicious anemia had sore, red raw-looking tongues. One also had angular stomatitis and vascularization of the cornea.

2. In each case it was found possible to control these changes with a single member of the vitamin B complex in pure form.

3. Four cases of glossitis responded to calcium pantothenate, and one each to nicotinic acid and folic acid.

4. One case responded first to nicotinic acid and later to riboflavin.

5. The patient with glossitis, angular stomatitis, and vascularization of the cornea responded to riboflavin.

6. It is suggested that the epithelial changes described reflect a breakdown in some metabolic system which may be similar to that responsible for the megaloblastic marrow and the neurologic complications of pernicious anemia.

From *British Medical Journal* (April 23) 1949.

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Loose Dentures As Esophageal Problems

IT IS BELIEVED that many dentists and some physicians do not appreciate the danger to the patient when a denture fails to pass through and instead lodges in the esophagus.

The growing use of radiolucent acrylic compounds for the construction of dentures makes the roentgenologist's job of diagnosis increasingly more difficult. When no radiopaque pins are used to hold the teeth to the denture, roentgen diagnosis will be missed sometimes. The endoscopist must be consulted.

Ether is the anesthetic of choice for the removal of large dentures. Ether provides maximum relaxation, permitting maximum working space. Extraction should not be attempted without adequate armamentarium. More harm than good can result from only slight manipulation of the foreign body.

Chemotherapy with sulfonamide compounds and penicillin has done away with the necessity for immediate external incision and drainage for esophageal perforations. Often surgical treatment is not necessary. Cases have been cited which demonstrate that the popular temporary denture made to supply upper central teeth should be abandoned by the dental profession.

Recommendations

1. The loose removable bridge should not be employed as it jeopardizes the wearer.
2. The risk of wearing a broken denture needs greater publicity.
3. The complete upper denture should be redesigned.

From *Journal of the American Medical Association* **140**:752 (June 25) 1949.

Dentistry and the Cerebral Palsied Child

(*Continued from page* 394)

is often refused because it presents problems with which the ordinary office cannot cope: (1) mothers of healthy children may object to the sight of children afflicted with cerebral palsy and (2) sometimes a general anesthesia is necessary.)

5. Inadequate fees for operations which are frequently time consuming.

Dental Methods

1. Dentistry for the cerebral palsied child is still in the pioneering stage.
2. General anesthesia has often been used as the simplest means to achieve relaxation or to manage an

uncooperative child. This method is believed by some authorities to have been overdone.

3. The barbiturates have been tried in premedication but have been found to produce a reverse effect.

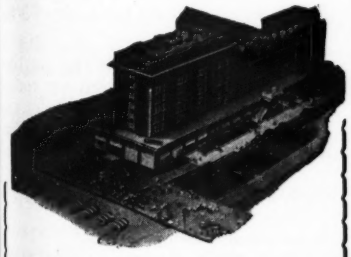
Conclusions

1. In general, dental treatment of cerebral palsied children which are not too severely handicapped does not differ greatly from treatment of healthy children.

2. Dentists who have had some experience report that with (1) a little more patience than is usually required and (2) proper assistance, the cerebral palsied child will become a good patient.

3. In mentally deficient cases (only 15 per cent of the cerebral palsied children are mentally deficient) general anesthesia is often necessary.

From *Journal of Dentistry for Children* **26**:16-17 (Second Quarter) 1949.



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P.O. BOX 1587, PITTSBURGH 30, PA.

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Dr._____

Address_____

City_____

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HANAU ENGINEERING CO., INC.
1233 MAIN ST., BUFFALO 8, N.Y.

Please send illustrated literature mentioned in ad.

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THE W. V-B AMES CO.
FREMONT, OHIO

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PREMIER DENTAL PRODUCTS CO.
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The trouble is, he doesn't plan ahead. He just concentrates on those big letters.

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And remember, U. S. Savings Bonds bring you $4 for every $3 invested.

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Automatic saving is sure saving—U.S. Savings Bonds

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YOUNG DENTAL MFG. CO.
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WILLIAMS GOLD REFINING CO.
BUFFALO 14, N.Y.

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City_____

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HOTEL STRAND
PENNSYLVANIA AVE., and BOARDWALK.
ATLANTIC CITY, N.J.

Please send information concerning room accommodations.

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Address_____

City_____

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HAWKINSON PRODUCTS CO.
P.O. BOX 683, DETROIT 31, MICH.

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